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AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 12 December, 1929 Number 12

THE STATUS OF FOOD POISONING IN RELATION TO OPHTHALMOLOGY

CHARLES M. SWAB, M.D.
OMAHA

Rats, rabbits, guinea pigs, and dogs were injected subcutaneously with botulinus toxin; cocks were injected intramuscularly; cats received subconjunctival instillations and injections into the anterior chamber; and pharmacological experiments were made upon nerve-muscle preparations from frogs and some other animals. The three specific strains of botulinus toxin were employed. From histological studies of tissues from poisoned animals, as well as from the pharmacological experiments, it is concluded that the toxin of Clostridium botulinum is a protoplasmic poison to peripheral nerve and striated muscle tissues, being more selective in its effect upon the former. It is probably also a general protoplasmic poison. The tissues in which pathological changes were found post mortem included the optic nerve and optic tracts, the retina, the choroid, and some structures of the anterior segment. Read before the Colorado Congress of Ophthalmology and Otolaryngology, June 28 and 29, 1929.

That food poisoning can be a cause of ocular symptoms has been recognized for many years. The knowledge of this possibility was quite common among physicians even before the study of the principles of bacteriology had become a prescribed course in medical training. In reviewing the earlier explanations of the causes of acute poisoning from decayed or decaying food we come upon the statement that the food contained ptomaines. This was the usual verdict in the past. In our day this theory of ptomaine poisoning has no supporters among bacteriologists, epidemiologists, and public health workers.

It is now generally accepted that most of the acute infections that follow the ingestion of spoiled food result from two microorganisms of the paratyphoid group, namely, the bacillus aertrycke and the bacillus enteritidis. Some of the paratyphoid group are capable of producing a toxin that is as virulent when taken into the body as the organisms that cause it. Obviously food poisonings may be of two kinds, infections and intoxications. Of the various sources of intoxication from food poisoning, this paper will discuss but one, owing chiefly to its relation to ophthalmology. This is botulism.

Botulism is usually regarded as the result of eating food that contains botulinus toxin. It is premised that the food contained bacillus botulinus as a contaminant and that a toxin was formed in the food before it was consumed. There are three recognized varieties of this anerobic organism, designated as types A, B, and C, each of which produces an individually characteristic toxin.

Observers have pointed out that bacillus botulinus can and does produce toxin within the body. This was shown by the experiments of Coleman and Meyer[1]. They fed quantities of the toxin-free spores of Clostridium botulinum to animals and succeeded in producing symptoms of botulism, which in some cases resulted fatally. Of the food poisons that produce acute infections or acute intoxications the toxin of Clostridium botulinum is the only one that causes ocular symptoms. Van Ermengem[2] recorded these as follows: "The botulinus syndrome consists essentially of a collection of neuroparalytic symptoms: a more or less complete external and internal ophthalmoplegia (ptosis, mydriasis, paralysis of accommodation, diplopia, internal strabismus)."

As Van Ermengem was not an ophthalmologist it is not surprising that he did not discuss other ocular lesions. It is a compliment to his powers of ob-

servation that the syndrome given by him has not been changed when the field was confined to a mere external examination of the eyes. In 1920 de Saint-Martin[3] reported four cases of optic nerve and retinal pathology in botulism. According to Ball[4] the existence of optic nerve and retinal changes in botulism was denied by Uhthoff. On this point it is only fair to state that Uhthoff[5] wrote as follows: "The ocular disturbances were always bilateral. In how far one is justified in speaking of a true amblyopia, in the sense of a material disease of the optic nerves and of the retina, appears very doubtful even today. At all events, positive ophthalmoscopic and anatomical findings in this respect have so far not been made. One is justified in all cases in tracing the visual disturbances mentioned solely to pupillary and accommodative anomalies. On the other hand, the statements of several authors about transitory amblyopias, even though with negative findings, are so positive (Cohn and others) that one can hardly doubt the occasional occurrence of actual impairment of the visual acuity. It must, however, be regarded as an exceedingly rare occurrence."

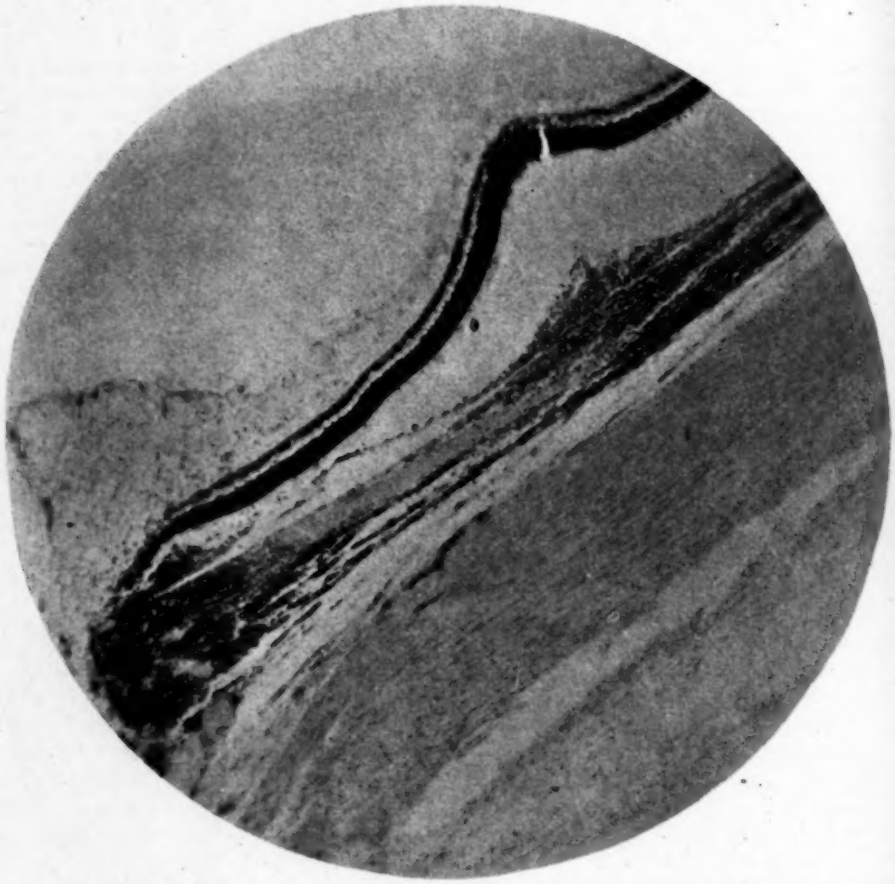

Fig. 1. (Swab). Botulinus poisoning. Low power view showing massive interrupted infiltration of the choroid. × 95.

The Journal of the American Medical Association[6] states that in the United States and Canada from 1899 to 1928, one hundred and fifty-six outbreaks have been recorded with a total of five hundred and twenty-nine cases. Fifty-nine of these have been proved bacteriologically and toxicologically. It is apparent from the statistics that many of

the cases reported on clinical evidence alone are open to question. Seelye's cases, referred to by both Uhthoff[5] and Dickson[7] in their discussion of this subject, were not cases of botulism. The patients had been poisoned by roast turkey. From the remnants of the turkey Seelye[8] made an aqueous extract. After dropping some of this solution into his eye he observed a definite mydriatic effect. It will be shown in the text of this paper that such an effect can not be produced even when undiluted botulinus toxin is instilled into the conjunctival sac.

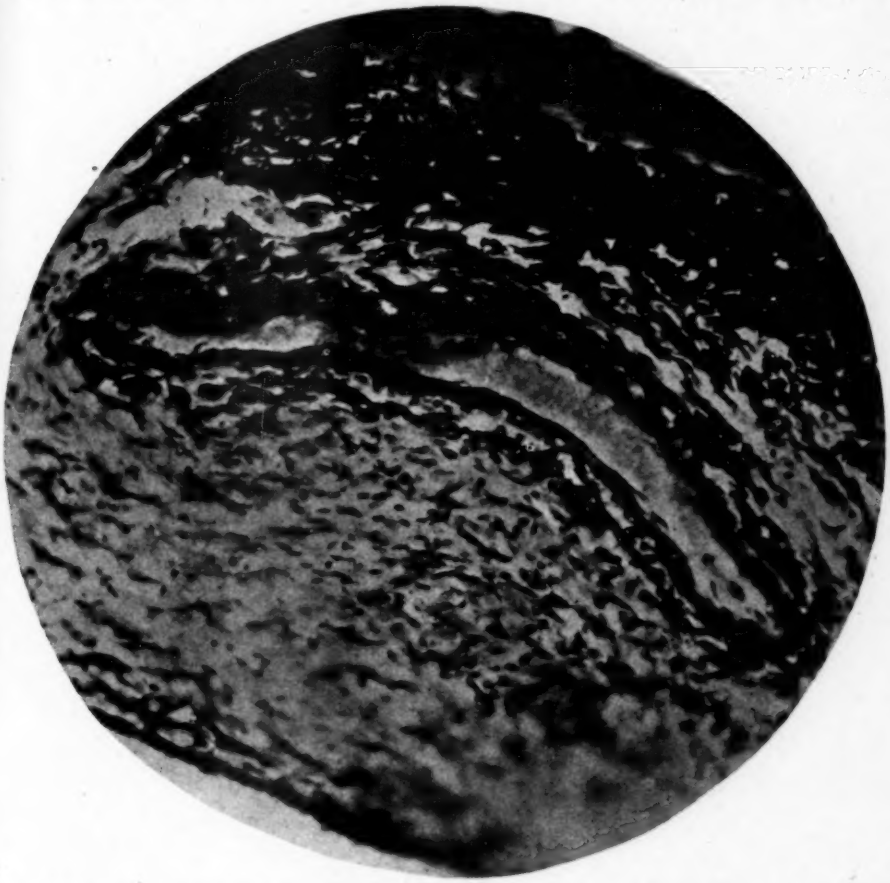

Fig. 2. (Swab). Botulinus poisoning. Perivascular infiltration of the iris. ×200.

Soon after the discovery of the bacillus botulinus, Marinesco[9], made histological studies of animals that had been fatally poisoned with botulinus toxin. He concluded that botulism was a disease of the central nervous system wherein the chief lesions were situated in the ganglion cells of the motor nuclei of the cranial nerves. In essentials these conclusions were approved by Kempner and Pollack [10] in 1897, by Ossipoff[11] in 1900 and by Römer and Stein[12] in 1904. Van Ermengem's review of the work of these experimenters is briefly as follows: It produces a cloudy fatty degeneration of endothelium, of the secretory cells of certain glands, of striated muscle fibers, of the anterior horn cells of the cord, pons, and medulla, and of the motor ganglion cells in the midbrain. There is an increase of neuroglia and a degeneration of the Nissl bodies.

Römer and Stein[12], selecting monkeys for their experiments, reported definite pathological changes in the nucleus of accommodation. The changes consisted

in tigrolysis and pyknosis of the cells, with partial absence of the Nissl granules, uneven staining properties, and irregular cell structure with eccentric or absent nuclei. They explained all of the third nerve lesions upon the basis of the nuclear pathology. As their work represented a large and technical piece of research and was approved by other

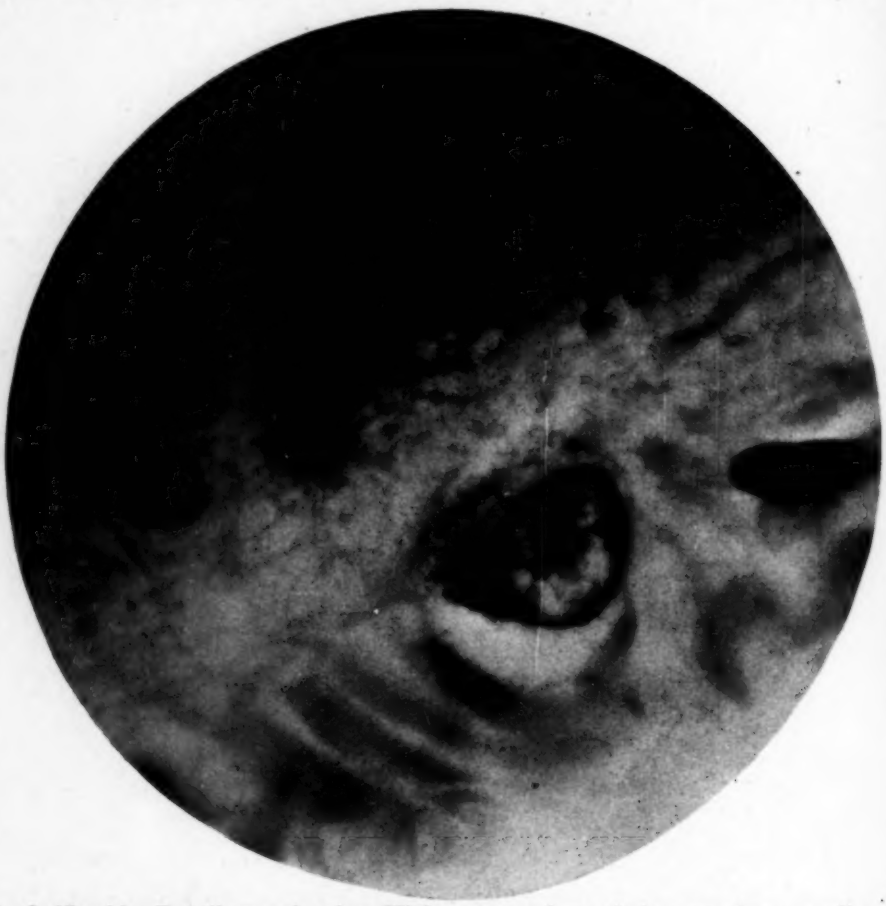

Fig. 3. (Swab). Botulinus poisoning. High power view of degenerating ganglion cells in the retina. × 1750.

European physicians their conclusion was generally accepted until 1914. About that time Wilbur and Ophüls[13], in reporting the pathology of a human case, declared that "the nuclei of the ganglion cells are perfectly normal". Observing marked thrombosis of the cerebral vessels, they were of opinion that the symptoms of botulism depended upon vascular changes.

Prominent among the American research students of botulism is Dickson, whose work and writings upon the subject are freely quoted in the literature. In the course of extensive experimentation Dickson and Shevky[14] stated that the lesions of botulism were not of central distribution but were peripheral. They arrived at this conclusion after they had been able to cause pupillary response in cats with botulinus-paretic pupils. This phenomenon was accomplished by means of a small electrode held in contact with the third nerve, the animal in each case having been partially decerebrated.

Edmunds and Keiper[15] conclude from their studies that "all essential symptoms of botulism can be explained by a more or less curare-like paralysis of the endings of the motor nerves to

the voluntary muscles, including the diaphragm, and by a more or less complete paralysis of the parasympathetic nerve endings".

The studies embraced in the present report were begun with the view of deciding whether or not there are ocular lesions in botulism. As the work progressed the material grew in abundance and it was decided to make as much use of it as possible. Owing however to lack of time much of the scheduled work has not as yet been completed. In the experiments herein discussed the material used was as follows: seven dogs, six cats, nine rabbits, three guinea pigs, five white rats, three cocks, and approximately thirty frogs. The rats, rabbits, guinea pigs, and dogs were injected subcutaneously with botulinus toxin; the cocks were injected intramuscularly; the cats were used for conjunctival instillation and injection into the anterior chamber; the frogs were utilized in furnishing nerve-muscle preparations for pharmacological experiments. Other animals not included in these figures were two rabbits, two cats, and one dog used for the purpose of obtaining nerve-muscle preparations of the extraocular muscles and ciliary nerves. By utilizing the homologue of the external rectus muscle in a cat this preparation was obtained once, but it was not well suited to the purpose.

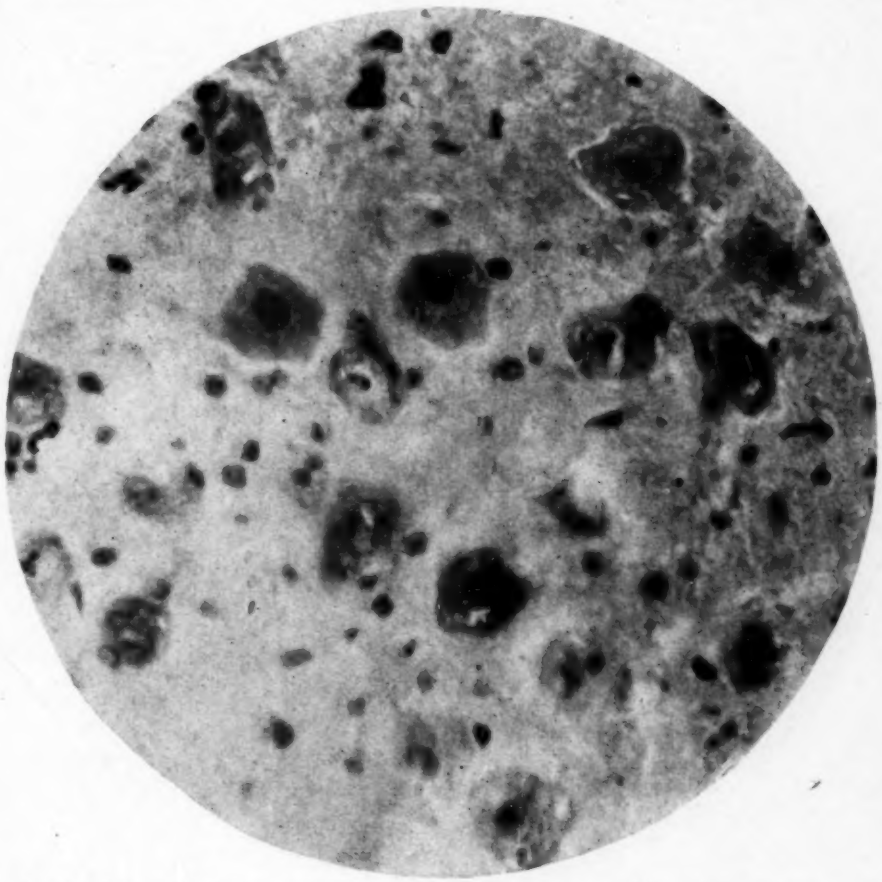

Fig. 4. (Swab). Botulinus poisoning. Degenerating ganglion cells in the midbrain. × 500.

The three specific strains of botulinus toxin were employed; namely, types A, B, and C. The experiments were conducted in the department of ophthalmic research and pathology of

the medical school of the University of Colorado and in the department of pharmacology of Creighton medical college. A report[16] of these studies has already been made, but as it has not yet been published I shall borrow freely from its text.

In the case of the rabbits, dogs, white rats and guinea pigs the intoxication was carried to the point of death, either by primary injection of the toxin or by repeated nonlethal doses. The latter procedure was tried in most instances in order to subject the animals to the intoxication over a longer period. In the case of all the animals studied for histologic changes in the eye and brain, the autopsies were performed immediately after death in order to rule out possible postmortem degeneration. In many instances where death was imminent the eyes were enucleated under ether. This even in small amounts brought about the end and facilitated immediate removal of the brain.

There was no apparent relation between the symptoms of salivation and excessive lacrimation in the dogs, as suggested by Edmunds and Keiper. Two of the seven dogs (twenty-eight per cent) had oversecretion of saliva. As there was a dysphagia in every case it was somewhat difficult to determine whether the constant driveling of saliva and discharging of nasal mucus depended upon oversecretion or upon inability to swallow. Dryness of the eyeballs with deep intoxication occurred almost simultaneously with loss of the normal winking reflex. In four

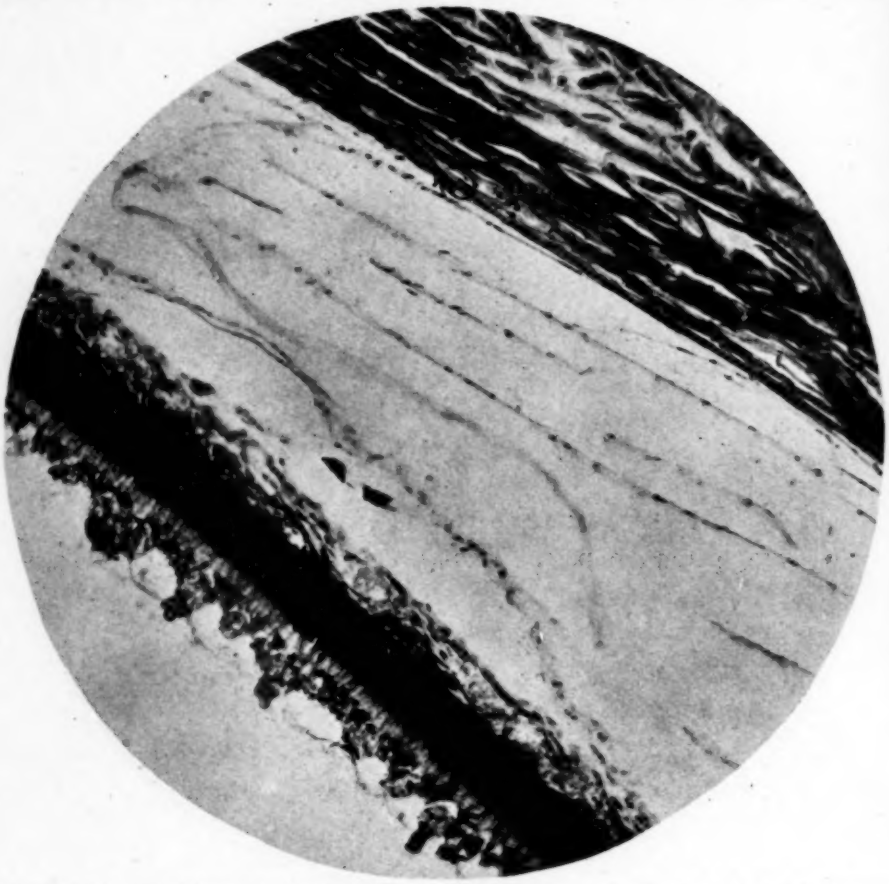

Fig. 5. (Swab). Botulinus poisoning. Low power view showing marked disintegration of the ganglion cell layer of the retina. × 100.

of these animals (fifty-seven per cent) there was a dull central opacity of the superficial layer of the corneas. There was pupillary widening in all instances after the intoxication was pronounced, but reaction to light occurred until a short time before death. Finally there was total loss of the light reflex.

In not one of the rabbits was excessive lacrimation noted. There was no salivation. Dysphagia was a constant finding and was thus noted in the protocols when mucous rattles were regularly heard in the throat of the animal. Dryness of the corneas was found in all the recorded specimens of this group except one, which had no eye symptoms, although it lived for six hours after leg and neck paralysis had set in. Two of the rabbits were observed to have episcleritis at a late stage of the intoxication. Only one of this series failed to show pupillary widening in some notable degree. One rabbit (sixteen and two-thirds per cent) developed nystagmus and a temporary convergence. One rabbit showed marked sympathetic irritability during the height of the intoxication. This was evidenced by marked pupillary dilatation when the animal was agitated. As soon as it became quiet the pupils contracted to their former size. There was no instance in which pupillary contraction could not be induced by strong light, although in some cases the reflex was not visible as such.

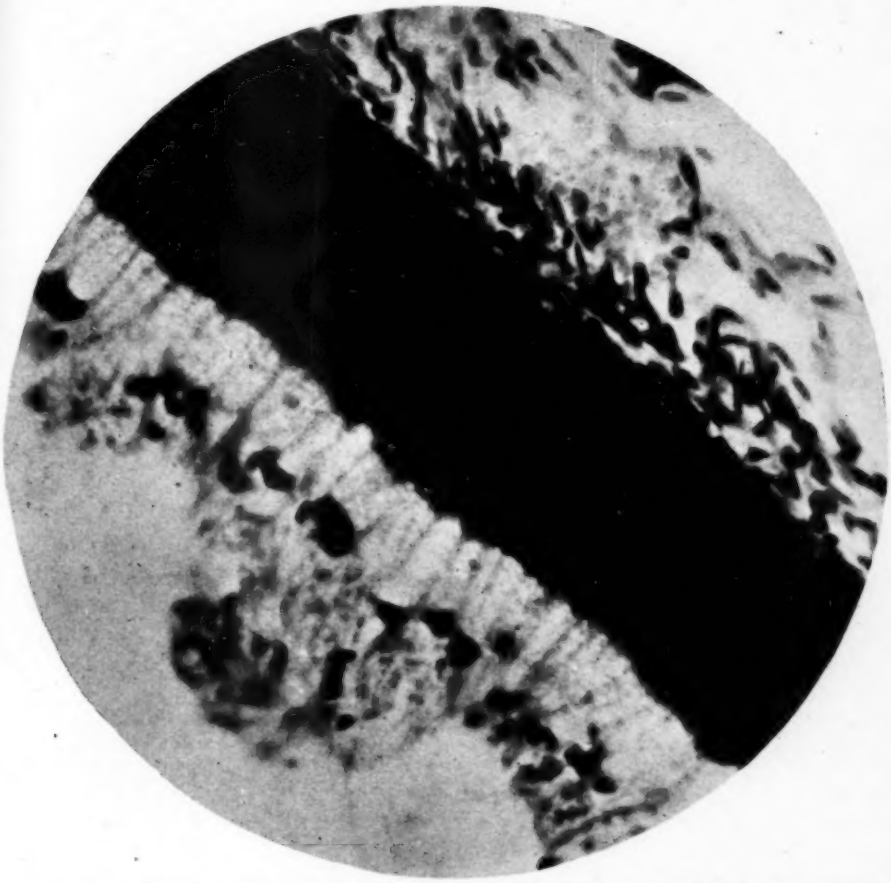

Fig. 6. (Swab). Botulinus poisoning. High-power view of the same field as no. 5. × 400.

The guinea pigs were so susceptible to the toxin that only one of this group could be studied during the intoxication

and then, owing to circumstances, too briefly for satisfactory notes. The others died during the night.

The cocks were injected with 0.1 c. c. each of toxin. Number 1 received type A, number 2 had type B, and number 3 received type C. Number 2 showed symptoms of limberneck on the third day. Number 1 became quiet and droopy after a second injection of 0.25 c .c. type A. It became symptom-free again after twenty-four hours. On the third day number 3 received another dose of 0.25 c. c. type C, as it showed no symptoms from the first injection. Two days later mild weakness of the wings was observed but there was no involvement of the neck muscles. As no eye findings had been noted the experiments on this group were discontinued and the cocks ultimately recovered. It was concluded that chickens may show symptoms of botulinus intoxication and yet apparently recover completely.

Two minims of toxin were injected into the anterior chamber of one eye of a cat, the other eye serving as a control study of pupillary effect. This was done with types A, B, and C each in a different cat. There was no apparent result from the toxin, nor was there any effect in the pupil after instilling the toxin into the conjunctival sac.

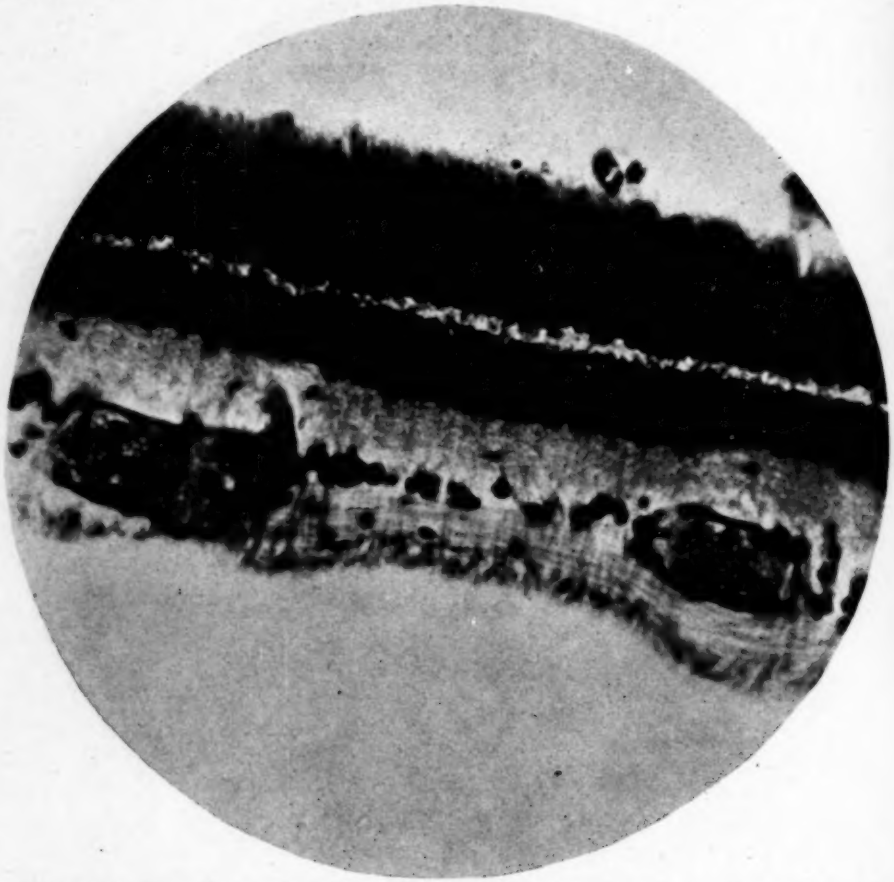

Fig. 7. (Swab). Botulinus poisoning. Capillary dilatation in the ganglion cell layer of the retina. × 300.

As the white rats were too readily susceptible to the toxin no suitable autopsy material was obtained from this group. All died without affording a chance for study during the period of intoxication.

It has been shown in a previous re-

port[18] that the toxin of Clostridium botulinum is a protoplasmic poison to peripheral nerve and striated muscle tissues, being more selective in its effect upon the former. It has also been suggested that it is possibly or even probably a general protoplasmic poison.

The histological findings in the nuclei of the third and fourth cranial nerves were: round cell infiltration; lymphoid cells packed into the parenchyme; extravasation of red blood cells; distention of capillaries with erythrocytes; stagnation of blood; migration of lymphoid cells; thickening of capillary endothelium; neuronophagia, chromatolysis, satellitosis, necrobiosis, nuclear, displacement, nuclear shrinking, vacuolization, powdery granulation of Nissl bodies, and complete disintegration of the ganglion cells; increase of neuroglia. Similar changes were noted in other parts of the midbrain.

Besides a diffuse small-round-cell infiltration beneath the ependymal lining of the third ventricle, there were diffuse round cell infiltration and massive extravasation of erythrocytes in the meninges. The meningeal vessels were distended with red corpuscles. Thrombosis was not frequent in the midbrain. In the optic nerves the findings included focal infiltration in the parenchyme, diffuse increase of neuroglia, and round-cell infiltration of the pial and arachnoidal sheaths. In the optic tracts were found round-cell infiltration, extravasation of erythrocytes, emigration of lymphoid cells, and stagnation of blood. In the chiasm the findings

Fig. 8. (Swab). Perivascular infiltration in the meninges of the midbrain. × 90.

were maximal infiltration, excessive packing of lymphoid cells in the parenchyme, and marked extravasation of red cells.

The retinal findings were as follows: fat formation in the ganglion cell layer; pyknosis, chromatolysis, and vacuolization of the ganglion cells; a powder-like reduction of the pigment granules; engorgement of the vessels with red corpuscles and stagnation of blood. In the choroid there was maximal infiltration involving all layers. There was round-cell infiltration of the corneoscleral junction. In the ciliary body there was round cell infiltration together with an increase in the connective tissue element.

The exudative lesions consisted chiefly of lymphocytes and monocytes some of which had differentiated into polyblasts while others had become transformed into plasma cells. The exudate occurred for the most part about the vessels, but in many instances there was a tendency to migration into the parenchyme. Where maximal infiltration was noted as many as fifteen rows of lymphoid cells were present around the vessel.

1316 Medical Arts building.

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CONGENITAL COLOBOMA OF THE UPPER EYELID WITH DERMOIDS ON CORNEA

REPORT OF CASE

WARREN D. HORNER, M.D. AND FREDERICK C. CORDES, M.D., F.A.C.S.
SAN FRANCISCO

The patient had a large coloboma of the upper lid, two dermoid growths on the cornea, and aberrant lacrimal glandular tissue near the outer canthus. A bibliography is appended. From the department of ophthalmology, University of California medical school.

Congenital colobomata of the lids are relatively rare. Only about one hundred and twenty-five cases have been described, and one hundred of these were reported prior to 1905. The first case was observed by Bannister (eighteenth century) and was mentioned by Wilde in 1862.

These lid defects are usually triangular in shape, the apex being directed toward the orbital margin. The cleft is usually situated to the inner side of the mid line and the upper lid most frequently involved. Both lids of the same eye may be affected and several defects may be present in the same lid. The cleft varies from a small indentation of the free border to a triangular or quadrate gap extending from the palpebral to the orbital margin, even invading the eyebrow. Of a series of forty-six cases collected by Dor and Nicolin, twenty-seven had one lid affected, sixteen, one lid of each eye; two, both lids of one eye; and in one case all four lids were involved.

The coloboma usually involves the whole thickness of the lid, yet the tarsus may be defective while the skin and conjunctiva are intact. The transition between cleft and normal lid margins is generally rounded, rarely sharp. The eyelashes stop at the angles and often markedly converge here. Meibomian glands are absent in the coloboma.

In a considerable number of cases the coloboma is filled with a bridge of skin which links the lid to the globe and which may extend on to the cornea as a form of conjunctival dermoid. The bridge consists of true skin containing papillæ, fat, hairs, and sebaceous glands, and may cause considerable hindrance to movements of the globe. In the absence of a bridge of skin, there are frequently dermoids or dermolipomas of the globe in the area corresponding to the coloboma.

The lacrimal passages are generally normal although in the cleft of the lower lid two puncta, one medial, the other temporal to the coloboma, have been observed.

Other congenital defects about the face attributable to defective development in the line of the facial fissures are frequently associated. Among these may be mentioned the hare lip, cleft palate, macroglossia and supernumerary auricles. The eyes proper may show opacities of the cornea, keratoconus, coloboma of the iris or choroid, and persistent pupillary membrane. The lids may show dermoids, amniotic bands, symblepharon, or other anomalies. Many of these may occur in the same patient. An illustration in Parsons' "Pathology of the eye" from Harman's article shows a boy who has on the right side a coloboma of the upper lid, a dermoid below and temporally, and one supernumerary ear. The left side shows a coloboma of the upper lid, coloboma of the iris and choroid, and three supernumerary ears. The boy further had macroglossia and a large fovea sacralis.

As to etiology, Hippel points out that the lid defects may be due either to some cause preventing development or to an agency destroying part of the well developed lid. A common cause for both of these has been found by Van Duyse in the pressure of amniotic bands, and this theory seems best suited to explain the greatest number of facts. Not only does it explain the colobomata but it also explains the cutaneous bridges, dermoids, and the like, these being persistent portions of the constricting bands. Congenital notches in the lower lid at the outer canthus occur

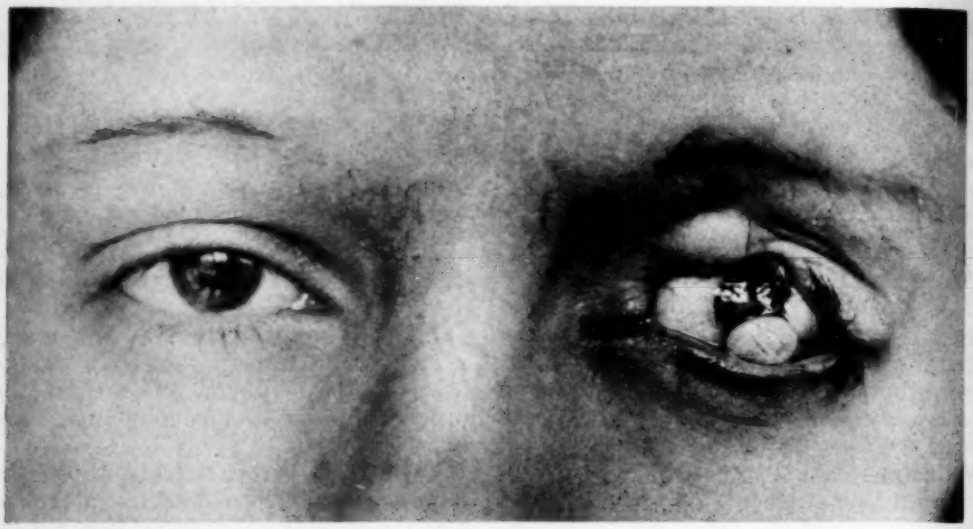

Fig. 1 (Horner and Cordes). Congenital coloboma of lid, and dermoids.

which suggest a duplication of the outer canthus. These differ from the usual colobomata of the eyelids, and thus far their origin has not been adequately explained.

The dermoid growths which are so frequently associated with congenital lid defects were described as early as 1742. Four cases were published by Wardrop in 1808. They occur as lenticular, yellow or reddish congenital tumors astride the corneal margin, usually on the temporal side and often in the space left by a lid fissure. They contain the elements of skin, such as stratified epithelium, hairs, sebaceous glands, fat, and the like. They may also contain cartilage and rudimentary lymph follicles.

Castillo believes that these tumors are best explained as due to adhesion between the embryonic globe and the tissue which is to form the lids. According to this author, if the adhesion involves only the ectoderm a simple dermoid results, but if it involves the whole thickness of the lid border a coloboma of the lid is formed, the dermoid corresponding to the coloboma. The cause of the adhesion may be pressure on the lids in intrauterine life and may be in relation to delays in closure of the oblique facial fissure.

The case reported by us is quite typical of a unilateral coloboma with dermoids, yet there are several unusual features. Immediately above the cleft of the upper lid there appeared a subcu-

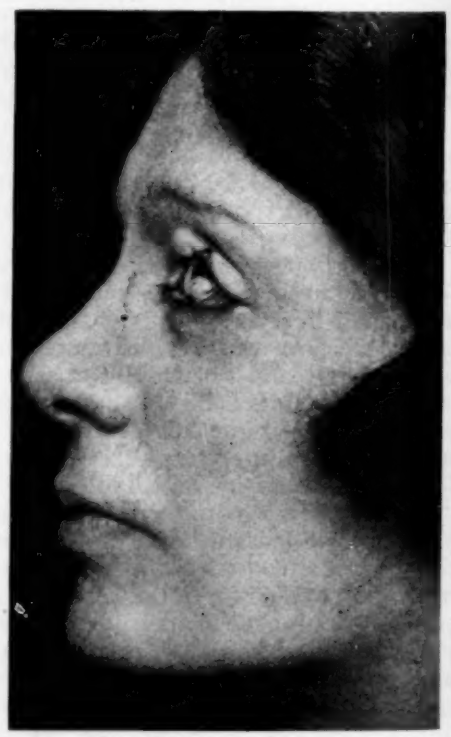

Fig. 2 (Horner and Cordes). Congenital coloboma of lid, lateral view.

taneous lipoma. Another soft tumor diagnosed lipoma was noted beneath the conjunctiva near the external canthus. This was found to contain not only fatty tissue but aberrant lacrimal gland tissue. (Figure 5.)

The history of this case is as follows:

Mrs. A. B. an American, aged twenty-eight years and a clerk by occupation, was admitted to the surgical service of San Francisco hospital in February, 1928, the eye condition being only incidental.

The family and the past histories were not important. No congenital or anatomical defects had been present in any of her twelve brothers or sisters or in her parents' forebears.

Physical examination, save for the eye condition, need not be gone into for this report. The detailed eye history disclosed that the defect in the left eye had been noticed at birth, but, as the patient lived in a small rural settlement in the middle west, her parents had never consulted anyone about it. The defect had first been commented upon only two years ago by the rhinologist who corrected a deviated septum. There had never been any pain or discomfort in the eye and the general appearance had not changed. She had never been able to read with the left eye but of the right eye vision was excellent.

Eye examination: The right eye is normal throughout. The left eye shows a V-shaped cleft or coloboma of the upper lid 19 mm. wide and 6.3 mm. in vertical extent, 3.1 mm. nasalward to the mid line of the lid. (Figures 1 and 2.)

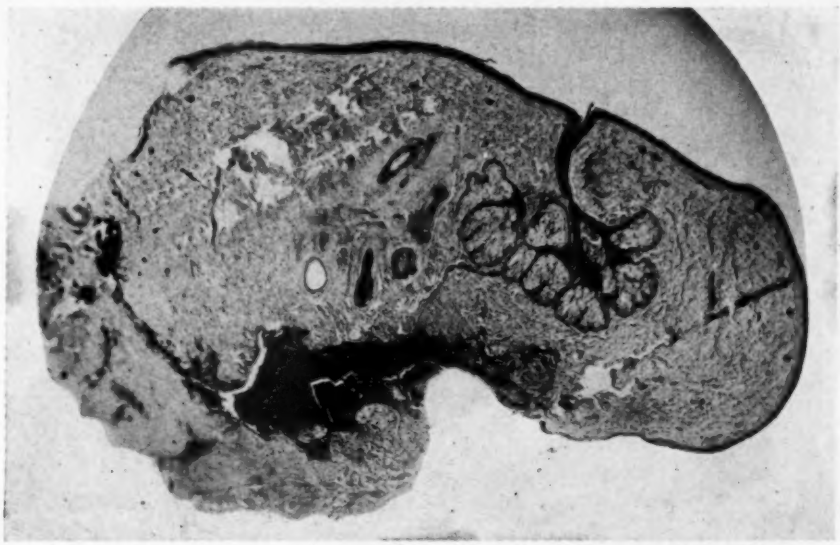

Fig. 3 (Horner and Cordes). Dermoid of cornea, showing gland tissue and hair follicles.

The nasal lip of the coloboma is 4.7 mm. long and its free edge ends at the lid margin in a blunt rounded knob which bears eyelashes. The temporal half of the lid droops and is quite lax.

Immediately above the cleft of the lid and situated beneath the skin is a rounded mass 9.5 mm. in diameter, soft in consistency and apparently attached to the skin. This is probably a lipoma. Beneath the bulbar conjunctiva near the external canthus is a soft tumor mass, also probably lipoma, measuring 12.6 mm. wide by 9.5 mm. from top to bottom. About four-fifths of its extent lies above the external canthal ligament. The color is yellowish. The conjunctiva over the tumor appears normal. The lower lid is normal. The lacrimal apparatus is also normal.

The cornea bears two rounded wax-like elevations, dermoid growths. The larger is situated directly below the pupil and astride the limbus, measures 9.5 mm. in diameter, and is elevated about 3.17 mm. It is soft and mobile but is attached to the cornea. Its surface glistens, is yellowish white in color, and from it protrude two hairs about the length of an eyelash. The second mass is similar to the first, measures 4.7 mm. in diameter, and lies temporal to the pupil, also straddling the limbus. It contains only one hair. The cornea bears a grayish opacity which covers the pupillary area and blends into the upper limits of the masses. The pupil is normal in size, is round, and reacts to light. There is no coloboma of the iris or of any of the intraocular structures. No other abnormalities are noted about the ears or other portions of the head.

On March 12, 1928, the patient was taken to the surgery, and under local anesthesia the dermoid growths were dissected from the cornea. A conjunctival flap was swung into place, partially closing the resulting defects. The mass beneath the bulbar conjunctiva near the outer canthus was dissected out and sent to the laboratory. All wounds were closed by fine silk sutures.

Following removal of the corneal tumors, the patient wore a vaseline patch over the eye at night to aid in proper closure. During her waking hours, the lid covered the cornea fairly well. The general cosmetic appearance was improved by the operation.

Fig. 4 (Horner and Cordes). Dermoid of cornea (high power), showing hair follicles, and sebaceous glands and ducts.

Sections of the corneal tumors were diagnosed as dermoid. The subconjunctival mass proved to be fatty tissue containing aberrant lacrimal gland tissue.

The pathological report of Dr. G. Y. Rusk is as follows:

"Microscopic examination of nodule no. 1 (figure 5) shows a mass of gland tissue being fairly well circumscribed and indefinitely separated from the surrounding connective tissues. From the conjunctival epithelium, duct-like structures extend into the denser connective tissue mass and lead to a group of large sebaceous glands, and in addition there are several hair follicles containing small but otherwise well formed hairs.

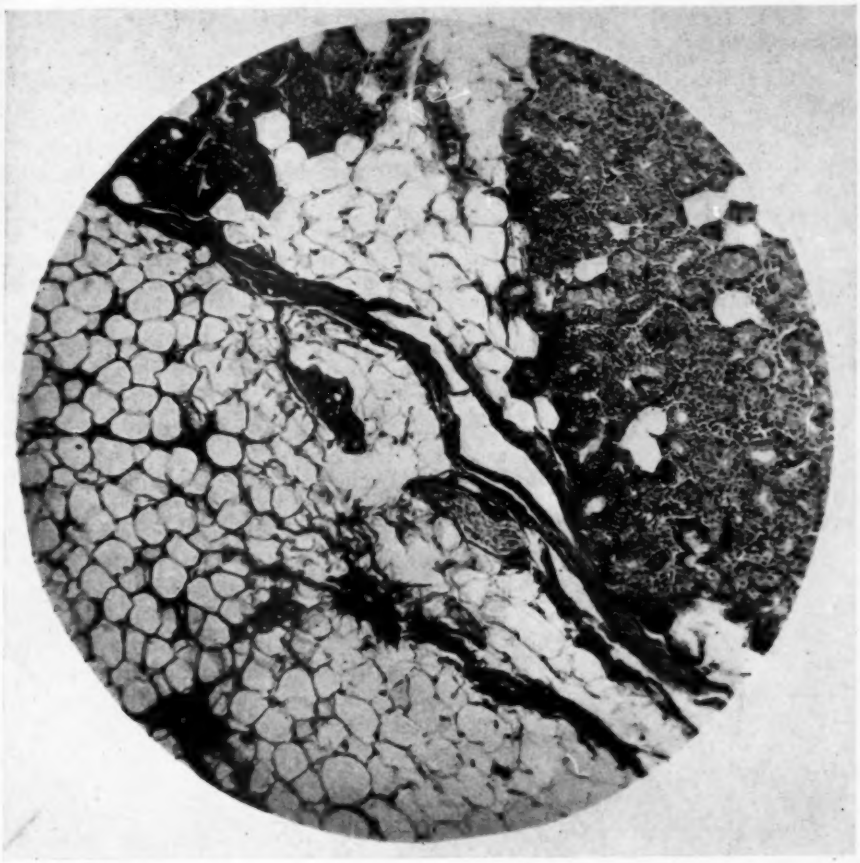

Fig. 5 (Horner and Cordes). Aberrant lacrimal gland and fatty tissue from subconjunctival tumor.

having the structure of normal lacrimal gland. The gland is surrounded by a mass of fat intersected by connective tissue bands of varying size.

"Sections from mass no. 2 (figures 3 and 4) show a rounded surface covered by a layer of slightly thickened conjunctival epithelium. Beneath this is a mass of rather acellular connective tissue consisting of broad collagen fibers, this particular area of connective tissue being fairly well circumscribed and indefinitely separated from the surrounding connective tissues. From the conjunctival epithelium, duct-like structures extend into the denser connective tissue mass and lead to a group of large sebaceous glands, and in addition there are several hair follicles containing small but otherwise well formed hairs. About the sebaceous glands and scattered in the perivascular spaces there is a slight infiltration with lymphocytes.

Diagnosis: Lacrimal glands (aberrant).

Dermoid of cornea."

We desired to attempt plastic closure of the lid defect but the patient was unwilling to have it done. It is hoped that she may consent at a later time.

384 Post street

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CAUSES AND PREVENTION OF BLINDNESS IN COLORADO

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This paper in devoted chiefly to setting forth statistics as to the causes of blindness in 1,203 cases in Colorado, 1,053 of them cases coming before the Colorado State Commission for the Blind and 150 of them drawn from private case records over a period of thirty years. Prevention of blindness depends on causing patients to seek proper treatment before irreparable damage to sight has been done; on proper diagnosis and care by physicians; on understanding by physicians of the causes of blindness, including general diseases; and on readiness to operate when necessary for the arrest or cure of ocular disease or for prevention of blindness in the second eye after one has been destroyed. Read before the Colorado State Medical Society, September 3, 4, and 5, 1929.

Medicine turns more to the causes and prevention of diseases and disabilities. Blindness, felt to be the greatest of disabilities to which we are liable, should properly be considered by the whole medical profession. The growth of specialism makes this more necessary. The beginnings of blindness are often in conditions that would never come first to the attention of the oculist; and the day for effective prevention has largely passed before definite eye symptoms command the attention of the patient.

Statistics of causes of blindness are lacking in many things that would add to their value. Those gathered in an earlier period do not apply for the present development of medicine. Those gathered in one part of the world would be misleading in another part. In different sections of this country the relative frequency of certain causes differs greatly. Different races, social conditions, occupations and prevalent diseases, present different causes of blindness. The general census, which accumulates so much information upon a wide range of subjects, including many for which specially qualified examiners are provided, leaves the matter of blindness to census takers. These get their information from people without any knowledge of the causes of blindness, and who may be interested in concealing the main facts. The census is notoriously inaccurate and incomplete in its conclusions as to blindness.

The statistics in medical literature are generally based on the experience of a single individual, or they partake of the deficiencies of the census. Even the records of institutions, or of authorities charged with the care of the blind, are far less complete and reliable than is to be desired. An institution deals with those who seek it, and with a few others heard of indirectly. State and local authorities have no direct means of knowing even the number of the blind within their jurisdiction; and very little about the real causes of blindness of those they have heard about. When definite reports on the condition of the blind are directly received, these are generally received so long after the condition leading to blindness that it is often impossible to assign the cause with confidence.

In Colorado the State Commission for the Blind, for the last four years, has been trying to get reports of all the blind within the state. The results of its inquiries are incomplete and often unsatisfactory. But they are in some respects more trustworthy than those accumulated in other states. To bring them to your attention may help in acquiring more complete and reliable information in future. So far as possible, the reports have been obtained from physicians devoting special attention to the defects and diseases of the eye. But, with the large area and scattered population of our state, reports from fully competent observers have not always been possible. Lists of members of the Colorado Ophthalmological Society were furnished to the county authorities, who first pass on all applications of the blind for assistance. An oculist's report upon the condition of each applicant is required, and arrangements were made to have, at the Colorado General

Hospital, expert examinations of all who might apply. But the importance of such examinations is not appreciated by all the county authorities, and in some parts of the state it seems not practical to bring applicant and skilled examiner together. Some very excellent reports have been received from general practitioners in isolated regions.

Applications for state assistance do not come from all the blind persons in a community, and some of them come from people who are not blind. Among those received were a few from persons blind in only one eye, but who had perfectly useful vision in the other eye; while in fifty-four the vision in the better eye range from 1/10 to 20/30. All such persons and all who did not conform to the standard for blindness, namely vision of less than one-tenth in the better eye, have been eliminated, leaving 1,053 cases from records of the State Commission for the Blind. To make the statistics more completely represent the conditions in Colorado, there have been added from the writer's private case records 150 cases of blindness, seen in private practice in Colorado within the last thirty years. This makes a total of 1,203 cases seen in Colorado, on which this paper is based.

Under "prevention of blindness" the editor of the American Encyclopedia of Ophthalmology says:

"The lack of accurate study on this subject is evidenced in the almost total absence of any large amount of reliable data and in the inexactness of those which are obtainable." "The records of most of our public institutions, as a basis for the study of statistical data concerning the amount of blindness which exists, seem to be absolutely worthless.

"It is evident that for scientific purposes the only records that are of any value are those which are made by trained and experienced ophthalmologists, but these are conspicuous by their absence where we would reasonably expect to find them."

It is well to understand why there is such a lack of accurate knowledge of the causes of blindness. Reasons for it have become evident in the work of the State Commission for the Blind in Colorado. In addition to the difficulty of getting good reports of "trained and experienced ophthalmologists", the greatest obstacle to securing satisfactory statistics is the long time that elapses between the beginning of a pathological process and its termination in blindness. A study of records of cases closely followed over long periods has shown that in a large proportion of cases of senile cataract as much as twenty years elapses from the beginning of the lens opacity until it produces practical blindness and forces the consideration of removal by operation. Even a disease that may be as terribly acute as glaucoma may in other instances last for ten years without causing the patient to seek relief from either pain or blindness. Trachoma may be contracted in childhood and only cause blindness when the distorted lids have caused rubbing of the cornea by misplaced lashes, during years of "weak" eyes and partial disability.

An individual blinded by smallpox at the age of two years did not seek a blind benefit until fifty-two years of age. Sufferers from congenital defects of the eye do not come under observation of an oculist until adult life. Cases of ophthalmia neonatorum are often neglected until they reach school age, without any close study of the conditions actually present. Adults with one eye practically blind from congenital defect may reach middle life before something happens to the good eye, to enforce the fact that it has done all their practical seeing.

Even persons who have become conscious of some serious defect consult one medical adviser after another, accumulating a miscellaneous collection of unrelated observations; later making it impossible to obtain anything like connected history of the condition observed. A patient with double papilledema, giving evidence of organic disease of the central nervous system, concealed the fact that two years earlier she had a breast removed for cancer. A young man with Leber's disease (familial optic

atrophy) persistently concealed the fact that two uncles had suffered from the same form of blindness; apparently because he knew of its unfavorable prognosis. This trait of human nature adds enormously to the difficulty of getting reliable statistics of the causes of blindness. It is for this reason that the 1,053 cases coming before the Colorado State Commission for the Blind have been supplemented by 150 cases drawn from private case records of the last thirty years.

The reports to the State Commission are often incomplete, but many show more than one condition that might have caused blindness, as cataract and glaucoma, or uveitis and corneal opacities. The lack of essential data often made it impossible to decide with certainty which of two or three conditions present was the real cause of blindness. The practical thing to do with such data is to mention what seems clearly the cause of blindness, or, where more than one cause for blindness is given, to mention each of the conditions that might have been the essential cause. This method does not balance the total cases by the sum of conditions present; it cannot show the exact percentage of cases due to each separate cause. But it does show what are the most important causes, those that should be guarded against and, so far as possible, eliminated in an effort to prevent blindness. It is from this point of view that the more important causes of blindness should be considered.

Cataract was noted in 460 cases as being present to an extent that might cause blindness. Less extensive opacities of the crystalline lens were present in many other cases. In eight cases the cataracts were congenital. In a few they were clearly, and in a larger number probably, traumatic. In five cases cataract was ascribed to diabetes, in a few to other general diseases, as influenza. But in a majority of cases they were clearly of the class called senile cataracts. In three instances they were specifically credited to "old age". The many impairments of nutrition that come with age leave wide room for further study, or for speculation.

Opacities of the cornea come next in frequency, 157 cases. This is a group in which there is great overlapping of causes. All the forty-nine cases arising from trachoma have opacities of the cornea, and these opacities are the chief cause of the blindness. All the cases ascribed to scarlet fever, 4, and to measles, 6, had corneal opacities. So had the 10 cases due to smallpox; the 16 cases, 9 certainly and 7 probably, due to ophthalmia neonatorum; the one case apparently arising from mumps; and one from typhoid fever. That was how four cases of pterygium caused blindness; and it was an essential part of all the 54 cases set down as "shrinking of the eyeball".

In 151 cases lesions of the retina and choroid, recognized by the ophthalmoscope, were set down as the causes of blindness. This includes 26 cases of angiosclerosis of retinal and choroidal vessels, but not the degenerative changes arising in myopia. There were two cases of obstruction of the retinal vessels and two of retinal hemorrhage, eight of renal retinitis, six of retinitis pigmentosa, one of circinate retinitis, and five of atrophy of the retina and choroid.

Atrophy of the optic nerve, 132 cases, was produced by syphilis in 22 cases (and probably in many more); in three cases it came from drinking wood alcohol, and in others probably from excessive use of ethyl alcohol and tobacco. Optic atrophy occurs in a rather wide range of general diseases, like cerebrospinal meningitis, influenza, mumps, lethargic encephalitis and disease of the hypophysis.

Glaucoma, in every case that goes on to blindness, shows optic atrophy. The cases of glaucoma, not included above, numbered 97. These were both primary and secondary cases, many being due to uveitis or to injury.

Uveitis, iritis, iridocyclitis, chronic or subacute, including two of tuberculosis, furnished 76 cases, besides 13 cases of acute panophthalmitis set down as the cause of blindness.

Injury was the cause of blindness in 66 cases. Among these were 21 caused by explosives, and 6 by gunshot wounds of the eye and orbit. Among the cases in which the injury caused blindness first in one eye were 17 in which the other eye was blinded by sympathetic ophthalmia. Lime burns caused blindness of both eyes in five cases. In one of these it was said that "both eyes were cooked". Detachment of the retina was noted in 15 cases, some traumatic and others myopic.

High myopia, with the degenerative changes that attend it, was clearly indicated in 43 cases; and was probably influential in causing blindness in other cases, especially of cataract. Blindness from myopia comes on very slowly, beginning in childhood and fostered by continued strain and neglect. It is surprising that even this many cases could be traced to their origin. Relatively it is a more important cause than these figures would indicate; since its share in causation of blindness interweaves with such widely separated causes as corneal scars, conical cornea, congenital dislocation of the lens, and cataract.

Other conditions that cause blindness appear in these 1,203 case reports. Congenital defects numbered 27, including, besides cataract, anophthalmos and microphthalmos 5, albinism 2, amblyopia 11, anomalies of the fundus 2. Vitreous opacities, given in 10 cases, are probably always associated with uveitis, or intraocular hemorrhage. Interstitial or parenchymatous keratitis was included with corneal opacities, which it nearly always leaves; and corneal opacities are always the way in which purulent (gonococcic) conjunctivitis, 4 cases in adults, causes blindness. Exophthalmos also causes blindness by corneal opacity, or by panophthalmitis. Erysipelas and apoplexy are mentioned. There was also one each of gunshot wound of the visual centers in the occipital lobe and of the optic chiasm, brain tumor, lethargic encephalitis, and fracture of the skull with vitreous hemorrhage.

Numerous conditions that have not been encountered, or mentioned in this study, may cause blindness. The prevention of all conditions causing blindness is a large undertaking. The prevention of blindness from any one of them is a matter of almost infinite detail. Manifestly we cannot now consider any of this detail; but from this review of the causes of blindness certain facts stand out that are of greatest importance in such prevention. It is a matter of close cooperation between eye physician, other branches of the medical profession, and the public. Prevention is going out to meet disease before it is manifest. This includes all measures of ocular and general hygiene in an age and civilization that lives by sight. But it also means the earliest recognition and treatment of the wide range of departures from health that may lead to blindness. In this sense, vascular and other degenerations may be prevented; and the whole body becomes the field in which to look for what may cause blindness.

Ocular lesions may be most likely to cause blindness; but prevention requires that their presence be discovered and their dangers understood early. Uveitis leads to blindness through a long course of attacks, incomplete recovery, and recurrences. It generally depends on extraocular causes. Focal infections must be looked for, not only in the teeth, tonsils, and sinuses, but in all other organs, if uveitis is to be permanently cured before it causes blindness through glaucoma, vitreous opacities, or choroidal atrophy. The underlying cause of cataract may be syphilis, diabetes, or parathyroid insufficiency. Causes must often be removed for effective treatment, and always for prevention.

To prevent blindness treatment must begin early and must be effective. It may be fifty years from the beginning of a myopia until it ends in blindness by cataract, detachment of the retina, or choroidal atrophy. There are usually years in which effective treatment of trachoma will prevent blindness, but later nothing may be of any benefit. Early treatment may preserve good sight in glaucoma. But when it has

caused blindness relief from pain is all that can be hoped for. The same is true of prevention of sympathetic ophthalmia. If optic atrophy can be checked, it is only by early treatment. The early treatment of all sorts of injuries to the eye will sometimes turn to a favorable result the doubtful situation that holds possibilities of useful vision and blindness.

The majority of eyes that become blind could have been kept with some sight by early proper treatment. The prevention of blindness depends on

(1) Persuading patients to seek good treatment at the earliest possible time.

(2) The readiness of physicians to recognize disease that may lead to blindness, when the eyes seem to be little if at all affected.

(3) The understanding that diseases which do not usually affect the eye may in some cases cause blindness and need to be watched with this in mind.

(4) The preparation of eye physicians to recognize the possible dangers of the conditions they treat; and their willingness to take responsibility for deciding when an eye should be taken out because it may endanger the sight of its fellow, or to operate, as for cataract or glaucoma, when this alone will prevent blindness.

It is a broad subject and only to be dealt with by broad study, broad view, and broad intelligence, on the part of the profession and of the community.

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PERFORATING INJURIES OF THE EYE BY SMALL STEEL FRAGMENTS

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A number of cases of injury by small particles of steel are briefly described, to illustrate (1) the direct ratio between severity of injury and size of foreign body; (2) the influence of the location of entrance upon the amount of permanent disturbance; (3) the occasional freedom of the crystalline lens from important opacity secondary to its penetration by steel fragments; (4) the difficulty of removing steel fragments from the crystalline lens after the capsule is once healed; (5) and the problem whether a very minute steel particle may ultimately be quite absorbed and disappear from the tissues of the eye. Read before the annual meeting of the Michigan State Medical Association, September 17, 18, 19, 1929.

My audience may wonder how I should expect to extract anything of particular interest from a subject that has amassed such a voluminous literature and whose every angle has been searched and commented upon.

My answer is that in the state of Michigan, largely through the development of the automobile and accessory industries not only in the larger cities but in most of the smaller towns, ophthalmologists have had unusual opportunities for observing injuries of the eye by steel fragments and might be expected to have accumulated, in the course of twenty-five years, experiences in caring for these injuries that would be worth relating.

Furthermore, inasmuch as I am limiting my subject to injuries of the eyes by small steel fragments, and chiefly to damage affecting the crystalline lens, and since the case records at my disposal are sufficiently numerous to illustrate fairly well the various themes that I shall present, I am hopeful that my paper will have a substantial value.

The damage done to the eye in foreign body injuries is directly proportional to the size of the foreign body.

This is a general rule with exceptions. Accidents from large foreign bodies usually result from considerable violence. As examples I may mention the breaking of a high-speed drill, the faulty action of a punch press, and frayed edges of punches flying from the blows of a hammer or sledge.

Injuries by large foreign bodies shatter the eyeball. Large rents of the cornea or sclera result with extensive loss of vitreous. The lens is expelled or ruptured. The globe collapses or, if it retains its shape, is filled with blood.

Perforating injuries of the cornea by foreign bodies of moderate size are characterized by irregular corneal wounds and emptying of the anterior chamber. The iris is prolapsed or becomes attached to the corneal wound. Tearing of the iris or ciliary body results in bleeding into the anterior chamber or vitreous. If the lens is injured, the capsule wound gapes and lens matter is soon extruded into the anterior chamber.

The most frequent cause of perforating injuries by small steel fragments is the workman striking a piece of hardened steel with a hammer. I could relate numerous incidents of superintendents, foremen, and skilled mechanics regretting too late the gentle tap which in a moment of carelessness they gave to hardened steel. The use of lead and brass hammers has perhaps diminished the occurrence of such accidents, but I have seen perforating injuries follow even their use. The history of such an accident is sufficient to make the ophthalmologist undertake a most searching examination of the eye and he must indeed be very sure of his ground if he dispenses with an x-ray examination.

In injuries by small foreign bodies the corneal wound is smooth and may be so inconspicuous as to be missed easily on inspection. The anterior chamber is not evacuated. The iris may exhibit a punched-out hole or a notch in the pupillary margin. If the lens is injured the wound in the anterior capsule shows a tendency to close promptly and the lenticular opacity resulting remains partial, or if it pro-

gresses it does so slowly. The vitreous is often clear and the foreign body may frequently be seen in the posterior part of the globe.

Injuries by small foreign bodies perforating the cornea near the limbus.

In going over my case records I have found ten in which a small steel fragment perforated the peripheral portion of the cornea, and a review of these records seems to warrant the conclusion that where small foreign bodies perforate the cornea near the limbus they pass through the zonular region and leave the lens uninjured. In each of the ten cases there was a punched-out hole or slit in the iris back of the corneal wound. The pupil was round in most instances, but twice it was pear-shaped, as it was drawn slightly toward the corneal wound. While there was usually some blood in the vitreous, this did not prevent the steel fragment from being seen in four instances. Twice the foreign body was located behind the ciliary body where one would not expect it to be detected with the ophthalmoscope. In only one of the ten patients was the lens injured and in this instance a limited flame-shaped opacity developed near the equator. The steel fragments were removed by the posterior route. Following the extraction eight of the ten patients retained useful industrial vision. One had a fragment of steel in the retina and detachment eventually followed. One had an old injury with a long retained foreign body, siderosis, and degenerative changes.

My records indicate that the eye does not so easily escape serious damage when foreign bodies of moderate size penetrate through this region. Evidently the zonular space between ciliary body and lens is not of sufficient width to prevent injury of these structures. Severe hemorrhage and cataract frequently result. As the wound approaches the pupillary zone of the cornea the frequency with which the lens is injured increases. However, I have two records showing the oblique penetration of foreign bodies that cut through the iris near the pupillary margin and yet entirely missed the lens.

Removal of small steel fragments from the lens without cataract formation.

I have had three patients each with a steel fragment in the lens, and in each of whom after extraction of the fragment the lens remained clear except for a scar of the anterior capsule. One such case occurred in 1915, the other two within a month of each other in 1926. These three cases occurred among approximately 250 cases of perforating injury of the eye with retention of a foreign body. In all three instances a small foreign body perforated the pupillary zone of the cornea and the anterior capsule, and lodged in the lens substance. A brief history of one case will be descriptive of the other two.

G. O., aged forty-five years, tool maker, was striking a hardened bushing with a hammer when something struck his right eye. The accident happened on February 26, 1926. The eye bothered him so little that he did not report the accident until after four days, when he noticed slight blurring of vision. I found a small crescent-shaped wound of the cornea in the pupillary area downward and nasalward from the center of the cornea. Almost directly back of the corneal wound there was a small wound of the anterior capsule of the lens, and a small foreign body with metallic glance lay in the central portion of the lens. The lens substance surrounding the foreign body was clear, except that the latter was partially covered by a thin grey film. The eye was slightly injected.

Under cocaine anesthesia a fragment of steel was readily drawn by a magnet through the capsular wound into the anterior chamber. It was allowed to remain there for twenty-four hours, at the end of which time it was removed through a tangential incision of the cornea. The delay in removing the foreign body from the anterior chamber was permitted in order that the capsular wound might close under the same conditions as when the steel entered the lens, namely, with a full an-

terior chamber. Healing was uneventful and the patient returned to work in five days on his own initiative. The vision one year later was 20/20 in each eye. Except for the small capsular wound the lens appeared clear with the plus twenty lens of the ophthalmoscope. The patient was again examined recently, that is three years after the accident, and with the slit-lamp I could detect no opacity of the lens substance. There was a small capsular opacity at the site of perforation.

Normal vision resulted for each of the other patients. The clear lens in each patient is undoubtedly the result of prompt closure of the wound of the anterior capsule and this was favored by the small size of the foreign body. The early removal of the foreign body after the accident was also a factor in the successful results obtained. The small fragments of steel removed from the last two patients were carefully weighed at the laboratory of Parke, Davis and Company, and the weights were 0.4 mg. and 0.47 mg. Foreign bodies such as these, less than half a milligram in weight, are minute in size.

A fourth patient with a foreign body in a clear lens was not so fortunate as the three just mentioned.

G. C., aged thirty-eight years, was examined the year following an injury to the right eye. There was a small scar of the pupillary zone, a scar of the anterior capsule, and a metallic fragment, centrally located, in an otherwise clear lens. As the steel had been there so long and vision was still good, no attempt to remove the steel was made at that time. One month later when the patient was again seen I was surprised to find that the foreign body had moved forward to the scar in the lens capsule and that the lens was becoming opaque. Two months later the chamber was shallow, there was a small amount of lens matter in the anterior chamber, the lens was opaque, tension was plus one, and the eye was painful. Under atropin the tension returned to normal. The cataract and steel together were removed six months later. The small fragment of steel which had been in the lens about eighteen months, was expelled with the lens. The fragment was not attracted by a magnet until the rust coating was removed by rubbing the fragment between my fingers. The small nucleus which remained was quickly attracted by the magnet.

I am unable to explain the change in position of the steel fragment from the central part of the lens to a point just beneath the scar in the anterior capsule. The patient worked in a large automobile plant; possibly his eye may have come into a magnetic field strong enough to move the foreign body.

Difficulty in removing steel fragments from the lens after the capsular wound is healed.

Fragments of iron or steel embedded in the lens substance are drawn readily by the magnet to the anterior lens capsule, but this structure is an obstacle to their passage into the anterior chamber. If the wound in the anterior lens capsule is not too tightly closed the foreign body may be drawn through it. Tight closure of the wound takes place by proliferation of the cells of the capsular epithelium and this process requires some time. In two of the cases cited, where the fragment of metal was removed from the lens without a permanent opacity resulting, the foreign body was drawn through the capsular wound without difficulty four days and nine days respectively after the date of accident. The following brief reports indicate the difficulty encountered at the anterior lens capsule and describe attempts to overcome it.

W. D., aged twenty-five years, injured the right eye February 2, 1927. He was first examined on March 12, 1927, that is after an interval of five to six weeks, and a small fragment of steel was seen in the lens. There was an opaque path through the lens to the foreign body. A magnet was applied to the cornea and the fragment brought to the scar of the lens capsule, but it could not be drawn through. The lens slowly became opaque and six weeks later both lens and foreign body were removed at the same time.

H. B., aged thirty-five years, was examined November 14, 1926. Six weeks earlier he had been struck in the right eye by a piece of steel. He had a lamellar cataract in each eye, apparently of congenital origin. In the posterior portion of the right lens, possibly projecting into the vitreous, there was a small metallic fragment, and a posterior cortical opacity appeared to be superimposed on the lamellar cataract in this eye. The vision of the right eye was 10/200 to 20/200, that of the left eye 20/50. A giant magnet brought the foreign body to the anterior lens capsule but it could not be pulled through. It moved so freely in the lens cortex just under the capsule that it simulated a foreign body in the anterior chamber. In fact, an opening was made in the cornea preparatory to removing the fragment from the anterior chamber before it was discovered that the fragment had not come through the lens capsule. A cystotome was introduced into the anterior chamber and a small puncture or incision made in the capsule over the foreign body, a procedure that has been suggested in such cases by Elschnig.[1] The fragment was then readily removed with the magnet. There appeared to be no further increase in the opacity nor decrease in visual acuity, although this, as stated, had been slightly less than 20/200.

C. W., vision began to fail in the right eye about July 20, 1924. The patient recalled no injury. Examination on August 4, 1924, revealed a small piece of steel in the posterior cortex of the right lens. There was considerable opacification of the lens with vision limited to seeing large objects. There was a mild iritis. As in several attempts the fragment of steel could not be drawn through the lens capsule this was pierced with a knife needle. The steel was then readily removed but the lens became gradually opaque; lens matter was extruded into the anterior chamber and the lens was resorbed.

R. B., aged forty-four years, was injured July 17, 1928, when a splinter of steel struck the right eye. The patient was not seen by me until three weeks later, as he had been treated in the first-aid department of his plant until he noticed that vision was failing. There was a scar of the anterior capsule, with extension of the opacity backward a short distance into the anterior cortex. The nucleus was clear and contained a steel fragment. There was a posterior cortical opacity, red reflex partial. Visual acuity, 10/200. The patient was observed for one week, and as the opacity was not increasing an attempt was made to remove the fragment. It could not, however, be drawn through the wound of the capsule. During the maneuver a sharp end of the fragment engaged the capsule at a point adjacent to the capsular wound, and by repeatedly making and breaking the current I was able to get the fragment to perforate the capsule. A second scar of the capsule resulted. The fragment was a spicule of steel about 1 by 2 mm. There was no immediate increase in the opacity, and five weeks after the operation vision had increased from 10/200 to 20/200. Three weeks later a definite increase in the opacity was noted. The anterior cortex had a silky sheen throughout and the posterior cortex was more opaque. Vision was 4/200. The patient's condition was the same when last examined about two months ago.

O. L., aged thirty-four years, was injured in the right eye by a flying piece of steel on April 19, 1929. A serious injury was not recognized at the first-aid station in his plant until after several weeks when vision began to fail. On examination, I found a scar in the pupillary zone of the cornea and a small fragment of steel in the lens cortex. Cataract formation was advanced.

An attempt was made to draw the steel through the lens capsule but this was not successful. The foreign body appeared to have no sharp edge and it could not be made to cut through the capsule by making and breaking the current. After repeated trials, no further procedure at the time was adopted. Some two or three weeks later, as the eye was red and irritated, another attempt was made to pull the steel

through the capsule, and this time it came through without difficulty.

From the above experiences I draw the following conclusions: If a fragment of steel lies in the lens and the opacification is not so advanced but what there is useful vision, an attempt should be made to remove the fragment as early as possible for eventually through siderosis complete opacification will probably result. A strong magnet should be used when the attempt is made to draw out the steel through the wound or scar of the anterior capsule, or through the intact capsule. Repeated efforts should be made, if there is difficulty in securing the foreign body. As a final resort, the procedure recommended by Elschnig, of incising the anterior capsule, is worth while.

May a small foreign body of steel undergo complete rusting in the eyeball and through resorption of the rust eventually disappear?

This question is raised by Wagenmann in his work on "Injuries of the eye".[2] It is of some practical importance, for occasionally when clinical evidence points to a small foreign body of steel having been in the eyeball for some time and the x-ray examination fails to show the presence of a foreign body, it has been assumed that complete rusting had occurred and that the fragment had become resorbed.

Such an assumption is not justified by negative x-ray examination alone, for not infrequently the roentgenologist fails to pick up the shadow of a very small fragment on the x-ray plate, due to its not standing out sharply from the shadows of neighboring bony structures.

Wagenmann does not give a definite answer to the question proposed. He gives several instances in which it was assumed that complete rusting had occurred, namely case reports by Cramer, Franke, Casali, Liebermann, Gilbert and Pihl, but cites the opinion of Hirschberg, which I translate as follows: "That an iron fragment of only 5 or 10 mg. weight through rusting and solution of the rust can disappear completely, I have not yet observed, although in many cases rusting of the entire iris shows clearly that the iron salts can be widely distributed. On the contrary I have removed from the eye with the magnet fragments of iron which had doubtless been there ten, fifteen, or thirty years. In the course of many years the fragment can become so soft that any other method of removal than with the magnet, as for example with the hook or forceps, appears quite impossible. In the majority of cases the splinter remains solid, the rust hull apparently protecting it against rusting of the nucleus."

While it is my own opinion that small fragments of steel in the eye may undergo complete rusting, it is probable that this only occurs with extremely small particles, smaller in fact than 5 or 10 mg., the weight mentioned by Hirschberg.

To the case reports cited by Wagenmann may be added a report by H. S. Gradle[3], who assumed complete rusting of a fragment of steel.

The following are two brief personal case reports bearing on this question:

H. B., male, aged twenty-eight years, came to see me August 8, 1917, on account of redness and soreness of the left eye. He gave a history of having been struck in this eye eight years previously, supposedly by a piece of emery. Three years later he first noticed a cloud in front of this eye and a change in the color of the eye from blue to brown. Consulting an eye specialist at this time he was told that there was possibly a piece of metal in his eye and that he should have an x-ray examination. He did not follow this advice. "The cloud in front of the eye became darker and darker, but the eye had not been inflamed or painful until about two weeks before he came to me.

On examination I found a small scar of the cornea situated about an eighth of an inch from the limbus at the ten o'clock position. In the ciliary part of the iris back of the corneal scar there was a v-shaped, sharply-cut defect such as is made by a foreign body. The anterior chamber was deep; the iris had

a deep brownish hue and was markedly tremulous. The lens was shrunken and opaque. Vision was light perception at three feet, projection faulty. The tension was lowered.

At the bottom of the anterior chamber there was a small quadrilateral-shaped foreign body, dark in color, which simulated a piece of iron or steel. It was extremely buoyant and bounced lightly about in the chamber with every motion of the eye.

To remove it I incised the cornea below at the limbus. My incision was slightly to the side of the median plane and I applied my magnet to the incision and its tip between the lips of the same in an endeavor to remove the fragment. It gave however, no evidence of being attracted by the magnet. I therefore enlarged my corneal incision with a pair of scissors so that part of my incision lay directly under the fragment. Immediately there was an escape of aqueous and with it what appeared to be fluid vitreous, and the fragment floated through the wound upon the conjunctival surface of the eyeball. Just as I touched it with a small forceps, to my surprise it appeared to have form without substance and broke up into numerous small flocculent particles, none of which was attracted by a magnet.

It would appear that in this case a piece of iron or steel, after lying in the eye for eight years, had become almost completely disintegrated. The siderosis establishes the fact that the fragment was of iron or steel. I should say that all of the iron must have been oxidized, as the magnet had no influence upon it. Had a longer time elapsed it is possible that the fragment might have broken down in the anterior chamber, and that complete disintegration and disappearance of a fragment would thus have occurred.

E. S., aged twenty-four years, was examined in 1918 and was thought to have a mere abrasion of the cornea. The lens appeared clear, the injury of slight significance. A year later he came in to see me with a well developed cataract. He recited the accident of the year before, as to having something fly into his eye when striking a piece of hardened steel with a hammer. Vision had been failing gradually for the last three months. I realized that I had probably missed a perforating injury with a steel fragment in the lens. When the pupil was dilated a dark sharply outlined mass in the lens came into view, likewise a scar of the anterior capsule.

The lens was removed by linear extraction. The foreign body was not found, as it appeared to have undergone complete rusting and resorption. Small dark grains in the lens matter, chemically indifferent, when examined under the microscope were assumed to be particles of carbon. The lens substance when acidulated gave a prompt iron reaction.

Minimal damage by small foreign bodies completely traversing the lens.

I have some fourteen case records of injury by a small piece of steel perforating the lens, that is entering through the anterior capsule, traversing the lens substance, and making an exit through the posterior capsule. As a group there is a tendency for opacification of the lens to be limited to opacity of the anterior capsule at the point of entrance, and opacity of the posterior capsule surrounding the point of emergence.

I shall briefly recite the history of seven out of the fifteen injuries, the seven patients recovering with useful industrial vision in the damaged eye.

W. F., aged thirty-nine years, was struck in the left eye in February, 1916, by a piece of high-speed steel. As the eye did not bother him much, he did not report the accident to his employer for three weeks, when the persistant redness and slight blurring of vision began to worry him.

Examination of the eye revealed a small linear scar just below the pupillary area of the cornea, a punched-out hole in the iris back of the scar, and a punctate scar of the anterior capsule of the lens adjacent to the lower margin of the pupil. The pupil was round and the iris was not adherent to the scar of the capsule. In a profile it could be seen that the anterior capsular scar ex-

tended slightly backward into the anterior cortex. Except for this punctate opacity the anterior cortex was clear, also the entire nucleus of the lens. In the upper temporal quadrant of the extreme posterior cortex, or in the posterior capsule itself, there was a thin disc-shaped greyish opacity near the middle of which was a dark punched-out hole which seemed quite clearly to mark the exit of a foreign body through the posterior capsule. The rest of the posterior cortex was clear.

The visual acuity of the eye was 20/50. X-ray examination showed in the vitreous a small fragment of steel, which was removed without difficulty through the sclera. I have no record of the size or weight of the foreign body but I recall that it was very small. This is also indicated by the size of the hole in the iris, which still persists.

This patient has been seen from time to time since 1916. He was last examined in January, 1929, that is thirteen years after the accident. The eye gives him no trouble. With a plus 1.00 sphere combined with a plus 0.50 cylinder axis 90 degrees, visual acuity is 20/20. There has been no change in the opacification of the lens. The opacity of the anterior capsule is still punctate, that of the posterior capsule broad, oval, fairly well outlined, appearing web-like when viewed with the ophthalmoscope. This posterior opacity is above and outward from the visual axis through the lens, which accounts for the good vision. The rest of the lens is clear.

A. V., aged thirty-two years, received an injury of the right eye March 30, 1926. I examined him on the following day. There was a linear wound of the cornea in the pupillary zone, 1.5 mm. in length, and behind this in the anterior capsule a corresponding wound. The latter had apparently closed, for there was no opacity of the anterior cortex. The nuclear region was also clear. A small, sharply punched-out hole could be distinctly made out in the posterior capsule under oblique illumination, and surrounding this opening there was a thin greyish opacity like a halo. Opacity and opening were mostly temporalward from the visual axis and were in the same curved surface. Examined through the plus twenty lens of my ophthalmoscope the opacity took the form of an irregular network of lines with the opening distinguishable but less sharply outlined. A fragment of steel well back in the vitreous, less than one milligram in weight, was removed without difficulty by the posterior route. The posterior opacity was observed from day to day. It decreased in size considerably, in a two weeks' period but a small network of fewer lines remained in which the opening was less sharply marked than at first. Vision on discharge was 20/40. The patient was seen several times during a six months' period. Subsequent claim has never been made for visual loss.

J. P. The right eye was injured November 21, 1923. A few days later I examined him and found a small central scar of the cornea, a scar of the anterior lens capsule, and a disc-shaped posterior cortical opacity. X-ray examination showed in the vitreous a small metallic fragment, which was removed posteriorly with a magnet. The opacity did not increase and three months after the injury visual acuity was 20/50. Recent examination of the claim file indicates that no claim for loss of useful vision has been made.

A. J. was injured in the left eye November 14, 1925. He was first examined on November 17, 1925. There was a small wound of the cornea in the pupillary zone, a wound of the anterior lens capsule, and a posterior cortical opacity in the upper nasal quadrant. A fragment of steel, 12 mm. back, 4 mm. above and 4 mm. to the nasal side, was removed from the vitreous. The opacity did not progress after discharge. Visual acuity was 20/50. There was no subsequent claim for loss of useful vision.

A similar injury was that of L. S., on March 28, 1924. In my record the posterior cortical opacity is outlined as star-shaped and well above the visual axis. Vision was 20/40. I have no subsequent record of vision in this patient.

H. G. was injured September 7, 1926. I removed a fragment of steel from the vitreous. There was a small central linear wound of the cornea, a wound of the anterior lens capsule, two faint linear opacities in the anterior cortex, and a posterior central opacity with a punched-out opening in the posterior capsule. Eventually vision was 20/40 with a plus 2.50 sphere combined with a plus 0.50 cylinder axis 90 degrees.

S. B. was examined November 6, 1926. He gave a history of an injury to his left eye in March of that year and stated that an x-ray taken at the plant hospital was negative for the presence of a foreign body. There was, however, a central scar of the cornea, a scar of the anterior lens capsule, and a linear path of opacity through the lens to the posterior capsule in the upper nasal quadrant. It appeared probable that the nucleus of the lens was not in the path of the foreign body. There was an indistinct scarred-over opening in the posterior capsule. Vision was 20/50. A check-up x-ray was negative, but just back of the posterior capsular opacity there was an indistinct opaque area, without definite metallic luster, that may have been a minute foreign body. The patient's eye had not changed when examined one year later.

Of the seven patients in this group of fourteen who lost useful vision all presented at first the opacities of the anterior and posterior cataract. In three patients the lens slowly became more opaque. One had vitreous infection, and in three the posterior cortical capsule was dense enough from the beginning and directly in the visual axis, so that only large objects could be seen.

The conclusion which I have arrived at from the observation of this group of fourteen patients may be briefly stated as follows:

A small foreign body frequently may pass entirely through the lens and yet the patient retain useful industrial vision. This is because opacification of the lens is limited to a punctate opacity at the point of entrance in the anterior capsule and a disc-shaped opacity of the posterior lens capsule at the point of exit.

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DENDRITIC KERATITIS FOLLOWING THERAPEUTIC INOCULATION OF MALARIA

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The fact that malarial infection, intentionally produced in the treatment of neurosyphilis, may result in dendritic keratitis has not apparently been brought to the attention of the neurologists and other clinicians by whom this method is being applied. In two cases here recorded, the complication was definitely attributable to the malarial infection, and resulted in serious lowering of vision. From the department of ophthalmology of the school of medicine of the University of Colorado.

The intimate relation between intermittent malarial fever and dendritic keratitis has been discussed by opthalmologists for over half a century. Kipp[1], in his first article on the subject, quoted A. Becker (Graefe-Saemisch Handbuch der Augenheilkunde, volume 5, page 350) as follows: "It is also said that at times, after the eye had been bandaged for a few days, the epithelial layer of the cornea became suddenly cracked and was thrown off in large patches, but was completely regenerated in a few days. This description corresponds closely to the rare and very painful keratitis, following intermittens, which has been described by the older writers, but is totally ignored in modern literature."

In 1889 Kipp[2] reported one hundred and twenty cases of dendritic keratitis following malarial fever. He thought that the eye affection was due to the malaria. He wrote: "It is commonly developed within a few days after an attack of intermittent fever, often simultaneously with the appearance of herpetic vesicles on the nose or lips. In some of my patients every fresh attack of fever was followed by this corneal affection. In the great majority of the cases that I have seen, only one eye was affected."

Ellett[3], Charles[4], and several others have reported similar cases; and at the present time malaria is accepted as one of the etiological factors of dendritic keratitis.

That the corneal appearance is not characteristic of malaria alone is certain. We now know that it is often seen during the course of other febrile diseases, and should be classified as a form of febrile herpes.

The possibility of corneal complications in malarial fever, and the serious impairment of vision that frequently follows, are not generally known to the clinicians and neurologists who are employing the plasmodium of malaria in the treatment of neurosyphilis. The following cases demonstrate that the danger in these cases needs emphasizing.

Case 1: Mr. E. P., aged thirty-seven years, was first admitted to the neurological service of the Colorado General hospital June 6, 1928, because of weakness of the right side of the body and face following an alcoholic bout. He did not lose consciousness, and the weakness disappeared in a few days. He, however, was alarmed about his condition and entered the hospital for treatment. On questioning, it was learned that he had had a "suspicious sore" in the mouth in 1919 and that the Wassermann reaction had been positive at that time. He had first noticed diplopia one year ago. It was transitory in nature but he thought that he had seen double recently. On examination no evidence of diplopia was found, but an upper altitudinal defect was found in the visual field of each eye. The pupils were irregular, unequal, and reacted sluggishly to light. Other neurological changes were found and a diagnosis of neurosyphilis was made. He was referred to the Colorado Psychopathic hospital for treatment.

On July 18, 1928, he was inoculated with tertian malaria, and he had his first chill and fever July twenty-eighth. The chills and fever—105°+—occurred at regular intervals, and after the fourth rise in temperature some discomfort was experienced in the left eye and the patient thought that he had scratched

the eye with his finger nail. The eye became red and painful and on the next day presented a typical herpetic infiltrate in the cornea. There were also herpetic vesicles on the left side of the nose. The eye became rapidly worse and in a few days the cornea stained with fluorescein in the usual branched manner. With the biomicroscope infiltrates were seen in the deeper layers of the cornea under the superficial areas of infiltration.

Discontinuation of the malaria was advised, and antimalarial therapy was instituted at once. Three additional chills occurred before the malaria was terminated. The eye healed slowly, and when he was last examined, November 16, 1928, a typical irregular scar was seen occupying the lower two-thirds of the outer aspect of the cornea. The vision had fallen from 20/20 to 20/70.

Case 2: Mr. J. H., forty-two years of age, was admitted to the Colorado Psychopathic hospital July 10, 1929, for the treatment of paresis. He was inoculated with malaria on July fifteenth. The first striking elevation of temperature occurred July twenty-first, and the temperature rose daily to 103° and above until August third, when the malarial fever terminated spontaneously. Pain was noticed in the left eye about August fifth, and three days later a well defined dendritic keratitis was seen. The abrasions in the superficial layers of the cornea were branched, stained with fluorescein, and extended over more than one-half of the corneal center. The vision in the left eye at the time of admission to the hospital was 20/30, and when it was last taken, August twenty-second, equalled 20/100.

These cases represent a true dendritic keratitis due to malaria. In the first case it was associated with herpes of the nose, and the ocular process was undoubtedly herpetic in character. I have found in the literature no report of similar cases associated with the malarial treatment for neurosyphilis. Since this treatment has offered good results in the hands of a number of competent neurologists and is becoming used more widely, we as ophthalmologists should take it upon ourselves to advise our colleagues of its possible danger to the eye.

I am indebted to Dr. Franklin Ebaugh, superintendent of the Colorado Psychopathic hospital, for the records of these cases during the patients' residence in that institution.

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LIPEMIA RETINALIS IN A DIABETIC

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A case of diabetes with lipemia, in which the characteristic ophthalmoscopic appearance associated with this complication was observed until the time of its disappearance under treatment with insulin, is made the basis for a review of the relatively scanty literature on this subject. From the medical service of Professor Thomas McCrae, Jefferson Hospital. Read before the American Ophthalmological Society, June 10 to 12, 1929, Hot Springs, Virginia.

Lipemia retinalis is a rare affection. Up to the present time only four cases have been presented before the American Ophthalmological Society, the first by Heyl in 1880, the second by Hardy in 1921, the third by McGuire in 1922, and the fourth by Hardy in 1923. In view of the comparative rarity of this affection and its infrequent observance even by ophthalmologists of wide experience, it seems proper that the present case should be placed on record.

Examination of the literature shows that thirty-five cases of lipemia retinalis have so far been reported, this making the thirty-sixth. In 1922 Wagener reported three cases in the American Journal of Ophthalmology, and in addition he has observed ten* in the Mayo Clinic, as yet not reported. With the vision usually unaffected to any extent by this disease, a routine ophthalmoscopic examination has undoubtedly not been made in many cases, and this may account in part, as stated by McGuire, for the small number reported.

Diabetes mellitus is properly considered a disorder of the normal metabolism of the body. Commonly the disturbance of the metabolism of carbohydrates is more evident than that of fat or protein. It is known that the fat of the body is handled abnormally in diabetes and is present to excess in the blood stream and the liver.

Lipemia may be defined as milkiness of the blood plasma due to an excessive amount of fat or to an altered physical state of the fat. It is not present in the blood of a normal individual when taken for examination in the post-absorptive period, although the blood plasma may contain an excess of cholesterol and its esters, lecithin and probably some fat. If the normal individual ingests an abnormal amount of fat or an additional amount is mobilized within the body, it usually produces a milkiness of the blood plasma which does not last for more than two to three hours. Bloor believes that the accumulation of fat in the blood causing the lipemia is due to the difficulty which the diabetic has in removing fat from the blood. Allen's conception of the cause of lipemia in diabetes is that a general cachectic condition of the whole organism exists which affects all cellular functions including permeability. The pancreas may secrete hormones which are specific in the removal of fat from the blood, just as it does for glucose. Insulin assists in the rapid removal of an excessive amount of sugar as well as of fat from the blood.

J. L., aged forty-two years, was admitted to Jefferson Hospital Nov. 26, 1928, complaining of drowsiness during the previous week. In addition, he suffered from weakness and from an annoying pruritus of the scalp. His family history was negative for the occurrence of obesity or diabetes. His mother died following a surgical operation for gall-stones and his father died of "old age." One brother and one sister are living and well. Both are moderately over weight.

The patient had measles and whooping cough during childhood. At the age of twenty-eight years he had several boils on the neck. His best weight was 186 pounds at the age of thirty-two years. He came under the professional care of one of us (H. K. M.) in 1921, complaining of excessive appetite, thirst and polyuria, weakness, and loss of weight, his weight being only 158 pounds. Physical examination showed nothing abnormal except relaxation of the skin due to weight loss. Blood-pres-

* Personal communication to the authors.

sure was 130/90, the pulse rate 80 per minute and regular, and the temperature 98.2° F.

On a twenty-four-hour diet of 85 grams of carbohydrate, 70 grams of protein, and 125 grams of fat, the urine of the patient became sugar-free in a week and the blood sugar, which was 224 mg. of sugar in 100 c.c. of blood, was reduced to 134. The patient continued on this diet and, not having occasion to consult a physician, was not seen until 1923, when a check of the diet, the urine, and the blood sugar was made. The urine was sugar-free, the blood sugar 121 mgs. per 100 c.c., and the patient commented on his excellent state of health.

On admission to the hospital the patient was dull and drowsy but could be readily aroused and answered questions.

The odor of acetone on the breath was marked and the respirations were twenty-six per minute. The pupils reacted normally to light, and the tension of the eyeballs did not seem decreased. The heart, lungs, and abdomen showed nothing worthy of note. The radial pulse was soft and regular, having a rate of 100 per minute. The blood-pressure was 110/80. The arteries of the body that could be palpated did not give one the impression that they were thickened. The patellar reflexes were diminished. The skin was dry and relaxed, and numerous pustules were present on the chest and on the skin of the forearm. There were a number of small brown pigmented areas on the skin of the shins resulting from old bruises, such as are seen in many diabetics. The specimen of urine examined immediately upon admission showed a specific gravity of 1030, a decided trace of albumin, 3.3 per cent of sugar, and the presence of acetone and diacetic acid. No casts were present but there were many oil globules. Examination of the blood showed 235 mgs. of sugar and the CO_2 combining power was 33.97 c.c. found as bicarbonate of soda per 100 c.c. of plasma.

When a specimen of the blood was withdrawn it had a creamy appearance and separated into an upper one-half of a creamy color and a lower one-half of a dark brown appearance.

With rest in bed, colonic irrigation with warm normal salt solution, forced fluids, and a diet of 60 grams of carbohydrate, 50 grams of protein, 50 grams of fat, and insulin, the patient became sugar-free on the fifth day after admission. He received 20 units of insulin twice daily, one-half hour before breakfast and supper. This was the first time he had received insulin.

The systolic blood-pressure while in the hospital varied from 100 to 112 mm. Hg and diastolic from 60 to 68 mm. Hg. The temperature was normal at all times. Chart 1 will show the progress of the patient both clinically and from the standpoint of the laboratory. He responded well to treatment. Although his fat metabolism is not as yet on a normal basis, he enjoys excellent health.

An eye examination was requested because of the diagnosis of lipemia and not because of any complaint referable to his eyes, and this was made on the day following his admission to the hospital. The pupils were equal and their reactions normal. Ocular rotations were unimpaired. The ophthalmoscope revealed the classic picture of lipemia retinalis. The disc was grayish or waxy in color and the margins were moderately indistinct. The vessels appeared broadened and ribbon-like, and of a distinctly salmon-like color, which distinguished the vessels throughout their course. In the periphery the vessels seemed to lose themselves against the background of the choroid. Over the disc the vessels appeared to coalesce and form a large central vessel into which the various arteries and veins emptied. This is definitely shown in the drawing. The arteries and veins were indistinguishable, a characteristic feature of lipemia retinalis. No choroidal lesions were exhibited. Three days later under insulin the vessels began to lose their peculiar salmon-like color, and within five days they had returned to normal.

Heyl[1] was the first to describe lipemia retinalis, which at first he referred to as

intraocular lipemia. Cohen[2] suggested the name of lipemia angioretinalis, as he deemed it more accurate. However, lipemia retinalis still remains the classic title of this rare condition.

The striking ophthalmoscopic picture, the peculiar light salmon or strawberry and cream or milky or light pink color of the vessels, the increase in diameter of the vessels, the similarity in appearance of the arteries and veins, their rather flat or ribbon-like aspect, and the absence of a central light streak, all combine to form a picture that should lead to a prompt and accurate diagnosis of lipemia retinalis.

Heyl[1], Hale White[3], Fraser[4], Hardy[5], Reiss[6], Turney and Dudgeon[7], Wagener[8], McGuire[9], and Chase[10] give vivid pictures of the appearance of the vessels. Usually the large vessels are salmon-colored and the peripheral vessels cream-colored. In our case the salmon color seemed to extend even to the extreme periphery. The intensity of the coloring of the vessels varies widely from a cream to an intense salmon color. The explanation offered by Moore[11] for this peculiar color of the vessels is as follows: "Ordinarily the choroidal vessels appear flat and diffused, as the light reflected from them passes through the retina with its pigmented epithelial layer a diffusing medium. The retinal vessels lying on the surface of the retina, light is reflected direct from the central axial stream without having to traverse any but transparent media. When, however, the central axial stream is surrounded by a plasma which on separating has the appearance of cream, the effect of a ground glass instead of a transparent envelope is produced. By this also the central light streak is lost as well as the cylindric character of the vessels. The retinal vessels in lipemia retinalis therefore simulate in appearance and character the choroidal vessels."

Various theories have been advanced regarding the striking fundus picture. It is generally assumed that the high content of fat in the blood is the basic cause for this peculiar appearance of the blood vessels. On the other hand, Wagener and other observers believe the "chemical or physical composition of the fatty constituents of the blood" cause the peculiar appearance of the vessels.

McCann[12], in a report of two cases which came under his observation, states that he does not believe the high content of fat can alone be responsible for the lipemia retinalis, for, despite the increase of the lipoid ingredients in the blood, the lipemia retinalis disappeared. Further, he says that "the state of aggregation of the fats has more to do with the appearance of the retina than the total lipoid content, and the abnormal appearance of the retinal vessels may be due to a film of fatty lymph in the perivascular spaces or to fat deposits in the adventitia".

Foster Moore[11] states that, while lipemia is described as appearing in a "number of widely differing diseases—e. g. chronic alcoholism, phthisis, asphyxia, nephritis, phosphorus poisoning, pneumonia, peritonitis, gout, starvation, and diabetes", he has been unable to discover any reported case in which lipemia retinalis was observed except when diabetes was the cause. An exception must be made in one of Wagener's cases, in which a lipemia retinalis was associated with leukemia retinalis.

The percentage of blood fat in the reported cases varied widely. In 28 cases the average of the total fat was 9 per cent, averaging from 4.24 to 26.5 per cent. In Wagener's 13 cases it ran from 1.04 to 8.8 per cent. Up to 1922 it was generally believed that lipemia retinalis did not appear unless the blood fat reached 4 per cent or above. In Wagener's cases, while the average percentage was 4.22, eight of the cases were under 4 per cent, two even reaching 2 per cent. High blood and urine sugar were noted in these cases, but according to Wagener there is no definite relation between the percentage of sugar and that of blood fat. He cited one case with blood fat of 8.8 per cent, the urine sugar 2 per cent, and blood sugar 0.312 per cent. On the other hand, one case of 2 per cent blood fat was associa-

ted with a urine sugar of 2 per cent and blood sugar of 0.36 per cent. In our case the blood fat was over 8 per cent, blood sugar 0.235 per cent, urine sugar 3.3 per cent.

A study of the effect of insulin on the fundus changes is interesting. In Wagener's thirteen cases, ten of which have not been reported, the average length of the lipemia retinalis was the same, twelve days, although in Hardy's patient, as in our own, it disappeared in five days under insulin. In Chase's case it disappeared in fifteen days. It is noteworthy, however, that in every case of lipemia retinalis the patient was seriously ill, either in a comatose or precomatose stage. At the time of his admission, our patient, as already stated, was in a semicomatose condition.

In Chase's[10] tabulation, which does not include Wagener's ten unreported cases, 57 per cent died, two had pneumonia, and ten had coma, which was probably the cause of death in five others. In Wagener's ten unreported cases, two died.

Lipemia may be produced by hemorrhage as demonstrated by Boggs and Morris.[13] While retinal lipemia has been regarded by some observers as the terminal incident of juvenile diabetes, it is found that the average age is about twenty-six, the youngest being nine and the oldest sixty-five years.

The incidence of sex is noteworthy. In Wagener's thirteen patients, ten were males and three were females. In the remaining cases so far reported the proportion of males to females was about the same.

The actual duration of the disease is of necessity conjectural, since it is impossible to determine accurately the onset. It usually varies from five days to three weeks. In the writers' case the actual return to normal was in five days. Wagener reports that "the highest blood fat, 8.2 per cent, showed the most stubborn lipemia retinalis. On the other hand, a patient with 5 per cent showed a normal return in five days and one with 3.5 per cent had a persistent fundus change for a week."

Our patient was discharged from the hospital two weeks following admission, feeling well, and determined hereafter, by reason of his experience, to follow closely the prescribed diet. On June 10, 1929, his last visit, he appeared in excellent health and his fundus was normal. Vision 20/20 in each eye.

The authors are indebted to Dr. Joseph M. Looney, of the department of chemistry of the Jefferson Medical College, for frequent chemical examinations and invaluable help in this study.

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HISTORY OF MY GLAUCOMATOUS ILLNESS

PROF. DR. LUDWIG LAQUEUR
"FORMERLY OF STRASBURG"

(Originally published in the Klinische Monatsblätter für Augenheilkunde in June, 1909, and now translated by Edward Jackson.)

Professor Laqueur was born in Festenberg, Silesia, in 1839. He died April 20, 1909. In July, 1874, when almost exactly thirty-five years old, he had the first noticeable prodromal attack of glaucoma. The attacks recurred mostly in the right eye, with increasing frequency and severity, in spite of the use of eserin. In March, 1880, Horner of Zurich did iridectomy, first on the right eye and a few days later on the left. Visual acuity and fields remained normal, and continued so until death. This account was written more than twenty-two years after the iridectomies, and was published posthumously. In the translation the personal character of the original has been preserved.

I was born July 7, 1839, of Jewish parents. From my family history the following points are noted. My father reached only the age of sixty years. He was healthy to the age of about fifty-seven, and died of nephritis. His eyes were emmetropic and entirely healthy. His mother reached the age of eighty-three, but was completely blind for more than thirty years. The description she gave me of her eye disease, which began with severe pain and inflammation, leaves not the slightest doubt that she was blinded by acute glaucoma of both eyes. The most celebrated surgeons of that time were consulted (also quacks) but naturally without result. Of her sixteen relatives, except myself, none has suffered from glaucoma. My father's father reached an age of seventy-seven years, remaining always healthy. The eyes of my father's brothers and sisters remained sound.

My mother was a healthy woman until sixty-five years old. Then began a weakness of memory that very slowly increased to senile dementia; and, with gradual bodily decline, my mother died when seventy-one years of age. Her eyes were emmetropic and fully normal. She came from a family tending to mental disease. This heredity was transmitted to my eight-year-old younger brother, who as a thirteen-year-old boy had attacks of paranoia. This brother was congenitally red-green blind. My other brothers and sisters remained free from eye or brain disease. My four-year-younger sister died at the age of forty-six, of pernicious anemia.

In my childhood I remained healthy. Of children's diseases I had only varioloid, and at the age of thirteen measles. As constitutional peculiarities must be noted that my face was pale and that violent bodily exercise, as mountain climbing, never reddened my cheeks. Vexation, anger, and particularly fright increased the pallor of my face. Cold hands and cold feet, from which I often suffer, indicate inactivity of the circulation. The heart impulse is always rather weak, and the apex beat almost imperceptible. Further I note that the skin of my whole body reacts unusually strongly to insect stings. All these peculiarities have remained throughout my whole life.

Early I noticed that, with good acuity of vision, colors were not so well recognized as by my comrades. Later I learned that I had a typical red-green blindness. This defect often caused embarrassment, and I sought to conceal it as well as possible. During my course of study and later in the examination of eye patients it was often a hindrance to me, yet my own example has demonstrated that in spite of such a handicap one can often make optical investigations, although not in the field of chromatics. My eyes were emmetropic and had visual acuity of 1. But it was noteworthy that they were entirely free from astigmatism; when a student I began to occupy myself with questions of accommodation, visual acuity, etc. I saw the stars as points and not star-shaped (or as small circles), as they are usually portrayed. I was always sensitive to light and had generally narrow

pupils. At the age of twenty-two years I suffered from a mild catarrhal conjunctivitis, which sometimes caused the lids to stick together. I then frequently used (in Cologne) painting of the lids with a 1.5 percent silver nitrate solution, with success. But the conjunctivitis was never entirely cured, and I am still subject at times to mild recurrences, which render the silver nitrate treatment necessary. During these relapses the sensitiveness to sunlight, which has never disappeared, becomes more marked and compels me to use smoked protective glasses on occasions when others can do without them, for example during walks, even on the city streets in the sunshine. But artificial light was fairly well tolerated.

At the age of thirty-three years I took a three weeks' trip in Switzerland. The weather was usually clear, and I wore out-of-doors, on account of my sensitiveness to sunlight, almost constantly dark smoked glasses in a pincenez with a strong spring. Before the end of this journey I noticed a change in my eyes. When I had returned home, I recognized that this depended upon an acquired corneal astigmatism (of 0.75 D.) of the right eye, astigmatism with the rule. This affection could only have arisen from long pressure of the pincenez. I made use of this personal observation in my article in Graefe's Archiv (volume 30, part 1, page 103). This astigmatism did not change up to the time of my operations and did not at all bother me. One who was not a specialist would probably not have become conscious of it.

In the next two years I noticed nothing striking in my eyes, until one hot July day of the year 1874 I had the first prodromal attack of glaucoma. That day I returned very late (two hours later than usual) from the clinic to my dinner at home, very tired, being exhausted and depressed by a tedious operation (blepharoplasty) complicated by severe hemorrhage, which I had performed. While I was still on the street I noticed a cloud before the right eye; during the meal a similar cloud appeared before the left eye, and when I struck a light and watched the flame I saw before my eyes for the first time the ominous color ring, which in the following years often made my life miserable. As I found both eyeballs hard, I was certain of the diagnosis.

Under the influence of mental diversion and a walk I became free of this phenomenon within a few hours, and the next two or three months passed without it returning. In the left eye it only returned two or three times, the last time in March, 1880, after the operation on the right eye; but in the right eye it appeared many hundreds of times. Its second appearance was again after great emotional excitement. In the winter of 1874-1875, the intervals were still long, and I was often free for two or three weeks—in the summer of 1875 and in the following winter they returned more frequently, and later occasionally thrice a day (lasting an hour or more), sometimes also in the night or on waking in the early morning.

The details of the phenomenon have been exactly described in my work on prodromal glaucoma in Graefe's Archiv, volume 31; of course I did not portray them merely according to my subjective experiences, but also according to observations upon other patients. The diameter of the halo I found smaller in myself than there given, namely, only eight or nine degrees; but the milder and severer attacks there described I was able to study in myself; in particular I can definitely assert that during more intensive attacks of longer duration the colors fade out and give place to a colorless halo. Not even in the more severe attacks did I ever experience pain or even somewhat decided injection of the eye. The reduction of central visual acuity varied between $\frac{3}{4}$ and $\frac{1}{10}$ of normal. Contraction of the visual field did not occur.

As to the exciting causes of the attacks I have also expressed myself in the work referred to above. I learned to know more and more the great importance of psychic influences; an access of annoyance, of anger, of confusion, even the agreeable excitement of stirring music or a fine scene at the

theater provoked the attacks; somatic influences included excess of hunger, staying in a bad atmosphere, in a hot room during evening gatherings, while exercise in the open air shortened the attack or caused it to disappear. When in 1876 I learned of the hypotensive effect of physostigmin, I made use of this remedy; it did not fail me in a single instance, and I do not remember that more than a single instillation was ever necessary. But I soon learned that it did not prevent the return of new attacks.

As the attacks became more frequent (always only in the right eye), I became slightly disturbed in my activity; I occasionally had an attack during my lectures or in the middle of an operation, and had to make great efforts to avoid anything being noticed. The thought of an operation (naturally only iridectomy, for substitute operations were at that time hardly mentioned) was therefore imminent. I decided to consult Horner in Zurich, and at the end of December, 1878, I made the journey to him. After very thorough examination he advised me not to have the operation done yet, but still to rely upon the palliative remedy, physostigmin; in the meantime he prescribed for me a very detailed diet and advised me to take small doses of quinine (0.15 gm. daily) over a prolonged period. His instructions, which upon the whole have proved effective, disclosed his distinctive quality as a physician who knows how to individualize, and as such he was justly famous.

I kept up a continuous correspondence with Horner, with whom I had assumed a relation of intimate friendship, and was able to inform him in the summer of 1879 that in spite of the five years' duration of the disease my condition was at least not becoming worse. In November, 1879, I again went to Zurich. Horner found the visual acuity still normal, the visual field intact, the optic nerve not excavated, but the substance of the nerve, as he expressed it, not so diaphanous as in the normal condition. After careful weighing of the pros and cons and having regard to my situation he proposed that iridectomy of the right eye should be undertaken, and decided to perform it during the next year's Easter holidays. I at once agreed to this sensible proposal. It will readily be believed that throughout the winter I was quite preoccupied by thoughts of the impending operation. For me it was a matter of my career, almost of my existence. The problem was not merely not to injure the eye by the operation, but to preserve it with full or almost full visual acuity—who can guarantee this?—and I further had before me the specter of a like ailment in the other eye. I steadily maintained my customary activity—only I restricted my pleasures and avoided more carefully than before the things which I knew to be harmful.

On March 16, 1880, I entered Horner's private clinic, the "Hottinger Hof". Except Horner, his assistants, and the nurse, no one knew my name, and as I was concerned that my operation should not become known to wider circles, I asked for secrecy, which was maintained as completely as possible. On the eighteenth of March Horner did (with the lance knife) the iridectomy on the right eye; as the eye was free from irritation, the operation was not particularly painful (cocaine was at that time not yet known); I might compare the feeling to a somewhat intensive burning—and quiet holding of the eye with the gaze directed downward was not too hard for me; my behavior during the operation gained for me flattering eulogies on the part of my operator, who was perhaps more emotionally affected by the surgical intervention in the eye of a colleague and friend than was the patient himself. At least he told me later that during my operation his assistants saw him tremble for the first time, him who otherwise always had an absolutely calm and steady hand. Nevertheless the operation was quite correct and the course of healing normal: for a few hours still a mild burning under the bandage, then complete freedom from pain. After three days I was able to get up, and after five

days could go out with protective glasses.

I should shortly have made the journey homeward, and the left eye would have remained untouched, if a fairly severe prodromal attack had not occurred in the left eye on the sixth day, without special cause. Although this attack promptly yielded to eserin, Horner decided also to do the iridectomy on this eye. I am under the greatest obligation to him for this decision; for without it my precarious situation would probably have persisted for years longer, and the operation would have had to be executed later under more unfavorable conditions.

On March twenty-fifth, therefore, Horner did the iridectomy on the left eye upward, this time, so I heard, with steady hand and quite in order. The pain was about the same as a week earlier in the right eye; but it did not quiet down after a few hours, but even increased after three or four hours and became so violent, radiating over the whole left side of the head, that I had to call for Horner. He found the eye greatly injected and assumed a violent acute attack of glaucoma (malignant course as sequel to the iridectomy); but the eye was not felt. Fortunately for me this assumption was not justified. I received a subcutaneous injection of morphine, after which the pain quieted down; I fell into a sleep of several hours and on waking was quite free from pain. From this time on the course of healing was quite undisturbed and on April fourth I was able to leave the clinic. The cause of the violent pain after the operation could never be determined.

I remained another nine days in Zurich, wrote or dictated, under the recent impression of what I had gone through, my discussion "on the prodromal stage of glaucoma" which appeared in Graefe's Archiv, volume thirty-one, then went for convalescence for another six days to Baden-Baden, and on April eighteenth was able, completely cured, to resume the full scope of my activity. The visual acuity of both eyes then amounted to ¾—⅝ after correction of the astigmatism, which in each eye, after complete cicatrization, two or three months after the operations, was 0.75 D. against the rule.

I have had a single prodromal attack since that time, in April, 1881—I am no longer quite certain whether it was in the right or the left eye—but since then I have fortunately not experienced anything of a glaucomatous nature (that is for twenty-two and half years); it is to be hoped that I shall continue to be free for the rest of my life[1].

As a result of the operations I must indicate a somewhat increased sensitiveness to light. This was, as above remarked, quite pronounced before operation, but was increased by the colobomata, although these were not large and were partly covered by the upper lids. Since that time I have therefore always carried smoked glasses in my pocket, to be worn when necessary, for snow or glaring sunshine, even in the city. Of evenings in brightly lighted rooms or halls this was never necessary.

Much more than by this dazzling I was annoyed by my concern that people might notice the iris colobomata, and I have suffered much and renounced much on account of this perhaps foolish thought. The fact of the matter was that in the right eye the coloboma was vertical, of moderate size, and with slightly divergent pillars, and was well covered by the upper lid, so that even an expert oculist would have detected it with difficulty without raising the lid. On the left side the coloboma was somewhat broader and its long axis deviated a little to the temporal side; in this eye it was partly visible with the usual opening of the lids, and this circumstance made me uneasy. The result was that I maintained rather strong contraction of the orbicularis, that when I talked with other people, especially colleagues, I did not look directly at them and assumed a frowning grimacing expression that people had not been used to finding in me.

I felt confused and restrained in my

[1] The author died in his seventieth year without symptoms having recurred.

relation with persons who talked with me at close range and looked directly at me, and must have given them the impression of a fellow with a bad conscience; the frequent spastic contraction of the orbicularis and of the corrugator even resulted in the formation of a persistent vertical fold of the skin of the glabella and of a few slight wrinkles of the forehead.

My timidity as to my condition becoming known to wider circles depended less upon apprehension that this might harm my position, my practice, etc., than upon the fact that I wished to avoid the many questions of sympathy and curiosity which were repulsive to my modesty. For this reason I have hitherto not published my observation of my own case, although de Wecker, who knew of my affliction, very urgently requested me to do so, in order to make use of it for his review "Sur la valeur de l'Iridectomie dans le glaucôma"; I only gave him a short notice on the favorable action of iridectomy in a physician.

Since my operations I have enjoyed on the whole good health; release from the burden which had oppressed my spirits had a favorable influence on my nutrition and my frame of mind. Intercurrent slight indispositions, such as colds, occasional but rare attacks of migraine, toothache, even violent emotional upsets, severe annoyance, produced no attack of glaucoma. The only ocular disturbance I need mention is typical scotoma scintillans, of which in the course of years I have had altogether five or six attacks. These attacks always passed off within fifteen or twenty minutes without further trace. For ten years I have suffered from attacks of tachycardia, which are probably to be attributed to the smoking of Havana cigars, and which in the last few years have bothered me rather frequently, sometimes daily. These also have remained without influence on the glaucoma. I can therefore regard myself as permanently cured. One may imagine how often and with what feelings of reverence and gratitude I remember my great teacher A. von Graefe, without whose discovery I should have become an invalid in the prime of life.

Beside myself two colleagues in the specialty have had the sad privilege of observing glaucoma in their own persons: W. Wagner in Odessa and Emile Javal in Paris. The first described his malady (glaucoma of the left eye), which like mine was completely cured by iridectomy, in Graefe's Archiv, volume 29, part 2, page 280, and in the Klinische Monatsblätter für Augenheilkunde, 1901, volume 2, page 558; while the latter gave a thorough account of his bilateral glaucoma, with unfortunately disastrous outcome, in the November issue of the Annales d'Oculistique, 1901.

Wagner's description is very interesting, but in my opinion presents little that is new. In several places he disputes my views as to the origin of the attacks, in particular he argues against the contention that a condition of depression causes the attack. His evidence however seems to me to speak rather for than against my view. He had his first attack in a session in a hot room after excitement by lively discussion, that is exactly the conditions which I adduced as incidental causes. Many of his attacks arose through such "causes as produced in him congestions toward the head". Disregarding the fact that this expression is somewhat obscure, Wagner's view must be opposed with the fact that one may feel poorly in spite of reddening of the face. He entirely confirmed in himself the prompt cutting short of the attacks by physostigmin.

As to Emile Javal's glaucoma and its tragic outcome much may be said. It is not mere chance that of the three ophthalmologists who have suffered from glaucoma two belong to the Jewish race; he, like myself, was predisposed to glaucoma by heredity. To this general predisposition was added a special one, that is to be attributed to his nervous system, particularly to the sympathetic—read what he writes con-

cerning his vasomotor disturbances, inequality of the two sides of the head in regard to temperature and secretion of sweat. The unfortunate outcome in the eye first affected is primarily attributable to the circumstance that the otherwise, as I could convince myself by actual inspection, quite correct iridectomy was executed too late; further, unfortunately, the contrary behavior of the patient after the operation, who in the winter, on the fourth or fifth day after the intervention, when the streets were covered with snow, went out, smoked, and did not spare himself[2].

It is quite comprehensible that Javal postponed the operation on the second eye as long as he possibly could—in my opinion however it would have been better to have it done after the first serious disturbances. No one can have a deeper sympathy with his terrible fate than I who came so near falling a victim to it myself.

[2] Javal himself says that he did not do these things until a month after the operation.

NOTES, CASES, INSTRUMENTS

A CASE OF BLUE SCLEROTICS*

ARTHUR A. KNAPP, M.D.
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A. L., female aged four years, was brought to the eye service of Dr. Agatston at the Sydenham Hospital dispensary because of the blue discoloration of her right eye. This condition has been present from birth, with no change in coloration. There has been no treatment of any kind. There is nothing of note in the previous history; development has been normal. There has never been any fracture, dislocation, strain, or deafness.

Of note in the family history is that a grandmother and an aunt on her maternal side, as well as the patient's mother, have stigmata of blue sclerotics. Each of them shows patches of bluish discoloration variously distributed over the scleras. Those of the mother do not show any increase in coloration or number over those of the grandmother. No such condition exists on the paternal side. Her younger sister, aged two years, is normal. There is no history of consanguinity; nor does a careful investigation of the family histories of each parent reveal any evidence of congenital defects other than as already noted. There is no chronic disease present in any member of the patient's family.

A complete physical examination is negative, except for the local condition. Thorough roentgen examination of the skeleton does not show any bone defect or bone lesion. The blood Wassermann and Kahn reactions are negative. The blood calcium is a high normal. Because of the finding of a thinning of the ear drum membrane in some of these cases, a thorough otological examination was made, with negative results. (This thinning of the drum membrane is thought to be associated with otosclerosis and deafness in later life.)

Ophthalmological examination: There is no buphthalmos, nor retarded development of the eyes. The axes of the eyes are normal. Vision in both eyes is good, as well as can be determined in so young a child. The lids of the right eye are light blue in color. There is a conspicuous slate-blue discoloration of the sclera of the right eye, which is in marked contrast to that of the left eye. This abnormal pigmentation is darker anteriorly from the border of the ciliary body. There is a comparatively normal colored patch of sclera circumscribing the limbus for half a centimeter. The pupil of this eye is equal to that of the left, is regular, and reacts to light and accommodation. The cornea and anterior chamber appear normal. There is neither embryotoxon nor bulging of the cornea. The iris is dull brown; the lens is normal. There is no muscular imbalance. Tension to palpation is normal. The eye is hyperopic.

The left eye shows a slight bluish discoloration of the sclera with a few darkly pigmented patches in the region of the limbus. The eye is normal in other respects.

Ophthalmoscopic examination shows normal fundi. The discs are not oval, nor is Fuchs's coloboma present.

The etiology of this condition is unknown. One theory is that there is an increased transparency or translucency of the sclera; another, that there is an increase of pigment in the pigmented cells of the sclera. Those who hold to the former theory believe that there is a lack of fibrous tissue in the sclera; still others think that there is an absence of lime salts, and this deficiency is used to explain the lack of fibrous tissue.

The rarity of this condition prompts me to report this case. In closing I wish to express to Dr. Agatston my thanks for his permission to do so.

2021 Grand Concourse

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* Read before the section on ophthalmology of the New York Academy of Medicine, May 20, 1929.

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AN UNUSUAL CASE OF DIPLOPIA

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The following case is reported not only on account of the unusual cause of diplopia but also for the rare location of an apparently tuberculous lesion.

R. S., aged twenty-four years, a patient at the Cresson state tuberculosis sanatorium complained of intermittent diplopia, which he said had been present for about two months, but was getting worse and at the present time, September, 1929, was almost constantly present.

Past history: In February, 1928, the patient had his left leg amputated half way to the thigh on account of tuberculous osteomyelitis. The stump never healed and the remainder of the femur and hip joint is now involved. At the same time, it was found that he had an advanced pulmonary tuberculosis.

About six months ago he had a swelling of the lower jaw which passed unnoticed, but shortly after that a lump appeared at the outer margin of the left lower lid. This he says opened, and since then a white, lumpy discharge has drained. There has been no pain or inflammation at any time and no tendency to heal.

At present, there is at the lower outer margin of the orbit an open sinus, about three-eighths inch in diameter, from which a constant discharge occurs. The lower lid is slightly everted and drawn down. There is a doughy induration of the upper lid. A moderate degree of exophthalmia is present. Diplopia is constantly present on looking to the left.

Vision is six-ninths in both eyes. Nothing abnormal is found in either globe, except a rather marked dilatation of the veins of the left fundus. The apparent upshoot of the left eye in the photograph is due to the drawn down lower lid.

It is found on further examination that a probe may be passed through the sinus, into the maxillary antrum, or upward back of the globe. The bone about the outer rim of the orbit is felt to be much roughened.

Unusual case of diplopia (Glover).

The x-ray plate shows a markedly cloudy antrum and bony destruction into the orbit. Examination of the nose is negative.

The lesion is typical of tuberculosis, as evidenced by the lack of pain and in-

flammation, although no tubercle bacilli are found in the smears. The sinus has evidently burrowed behind the globe, causing the enophthalmos and the edema of the upper lid. Partial destruction and adhesions about the external rectus would account for the diplopia.

Only local cleansing treatment is attempted, as the patient's condition is too serious for any radical sinus operation.

I am indebted to Dr. M. E. Cowen, of the Cresson sanatorium, for the photograph and the x-ray plate and to Dr. Appel, secretary of health, for consent to publish.

1200 Fourteenth avenue

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

CHICAGO OPHTHALMOLOGICAL SOCIETY

May 27, 1929

Dr George F. Suker, president

Epithelial dystrophy of the cornea

Dr. Dewey Katz presented a man of fifty-three years whose history stated that vision had always been subnormal. Six weeks ago both eyes began to tear, the left more than the right. The left eye became red, with marked photophobia, lacrimation, and diminution of vision, but no pain.

At the time of admission to the hospital vision was R.E. 10/200; L.E. 4/200. The right cornea revealed a diffuse haziness of the central eight millimeters. Oblique illumination gave the cornea an edematous appearance. The biomicroscope showed absence of corneal edema but a much thickened epithelial layer containing numerous very small shallow depressions. The sensitivity of the cornea was absent in the center and markedly diminished throughout the remaining portion. The left palpebral fissure was one-third narrower than the right. There was marked photophobia, lacrimation, and ciliary injection. Bordering the limbus from the 5:30 to the 6:30 o'clock position, and extending toward the center of the cornea for four millimeters, was a square yellowish-white opaque area extending through the anterior one-third of the cornea. In the center of this area was a loss of substance. Numerous superficial and deep vessels crossed the limbus in this region and extended varying distances into the ulcer. The rest of the cornea, except for a narrow rim at the limbus, showed the same thickened epithelial layer as in the fellow cornea, with its numerous small depressions. There was no hypopyon. The ulcer was treated by electric cautery. The progression ceased and the area was filled in very slowly by scar tissue.

The case, except for the ulcer complication, was a typical example of Fuchs's epithelial dystrophy of the cornea. Neither increased tension nor tabes, two findings frequently reported in this disease, was present.

Lupus vulgaris

Dr. Joseph C. Beck showed a case which had been under observation for a number of years. This man's mother had been treated for a similar condition, which never extended beyond the vestibule. She had gone to Florida to live and it seemed that this had improved the trouble. This patient had the same condition about the nose, palate, and larynx. It looked like tuberculosis, though that had not been identified. Lungs and general physical findings were negative. Four eminent dermatologists had seen this man, without agreement at any time that it was true lupus until a section of tissue was removed from the palate, when etiological examination showed a typical disease analogous to a tuberculous process. About seven months ago the pa-

tient thought his vision was diminishing. Upon examination some corneal opacity was seen and the patient was referred to Dr. Gradle. In treatment of the skin condition every conceivable sort of radiation had been used, always by expert dermatologists who were particularly careful about screening the eyes. Nothing had any effect until injections of colloidal gold were tried, when improvement was noted so far as the skin condition was concerned, but the sight began to fail. The treatment might have had something to do with this. Twenty milligrams three times a week had been administered, thirteen treatments in all, intravenously.

Discussion. DR. HARRY GRADLE had seen the case first in November last, at which time vision in the right eye with correction was 0.5, in the left eye 1.00. Under mydriatics the corneal lymph system appeared slightly dilated, anterior chamber normal, iris normal, lens clear, except possibly a slight opacity, and the fundus normal in all respects. In the left eye lens and fundus were normal. One month later the opacity had advanced somewhat in the right eye, and was beginning in the left. The anterior chamber was clear and contained no cells. From that time on there had been rapid and marked increase in the opacity of the lens on its posterior aspect—the anterior lens fairly clear. Vision was now 0.3 in each eye. The opacity corresponded to the type described by Wagenmann.

Whether or not this condition was due to lack of nutrition he was not prepared to state; whether or not due to toxemia, it was impossible to say. No lesions could be discovered with the ophthalmoscope. Administration of thyroid increased the pulse and gave symptoms of hyperthyroidism, but had no other effect. Whether the opacity was due to the tuberculous process of the external mouth and internal throat, to the administration of colloidal gold, or to the large amount of therapy in the form of radium and x-ray, etc., was a question. Undoubtedly bilateral extraction would improve the vision. His personal opinion was that the condition was due to a toxemia associated with a tuberculous process.

Congenital absence of choroid

DR. WOLF presented two brothers aged forty and forty-four years respectively. There was a history of poor vision since childhood, and the mother, who was dead, also had had poor vision. Three living brothers had normal vision. Two years ago the elder brother had had a skull fracture from which he was unconscious for two weeks, and he thought this had made the vision worse. Vision at this time was R.E. 20/60; L.E. 18/200. That of the younger brother was R.E. 18/200; L.E. 20/200. Both patients were moderately myopic. No external anomalies were present. Pupils were normal; irides greenish-blue. Fundi in both eyes of each patient were similar, showing normal pink nerve-heads against a greenish-white background; retinal vessels were of normal size and distribution. Some irregularly distributed choroidal vessels were seen in the macular region and just temporal from it. The remainder of the fundus presented complete absence of choroidal vessels and pigment. Here and there in the periphery were a few small patches of dark retinal pigment. Tension was normal; visual field was contracted to an irregular tube; perception for red was limited to fixation point. Several blood and spinal fluid Wassermanns had been made, all of which were negative.

Severe eczematous keratitis

DR. GAIL SOPER showed a white girl, twelve years of age, who had been under observation for about three months. She had had poliomyelitis at fourteen months of age, and later pneumonia and whooping cough. She had asthmatic attacks, and was sensitive to peaches and to dog or cat hair. Physical examination showed poorly nourished teeth and a tonsil fragment. Wassermann was negative.

When first seen, February 27, 1929, there was moderate lacrimation, burning, and photophobia of both eyes. Vision R.E. was 0.8, L.E. 0.6—2. Super-

ficial linear infiltration six millimeters long, staining slightly, extended from center of left cornea. On March fourth, the superficial linear ulcer was 0.5 to 1.5 mm. wide from corneal center to limbus, at the six o'clock position, with curving and branching processes similar to those seen in dendritic keratitis. The pupils dilated poorly with atropin. On April first, the ulcer showed an apex two millimeters above the corneal center and base five millimeters wide at the lower limbus; there was considerable infiltration and deep and superficial vascularization of corneal substance at the borders. She was referred to Cook County hospital, where a conjunctival flap operation was performed. Vision at present was 15/200. The case was interesting because of the unusually severe effect of the first attack of eczematous keratitis.

Ophthalmoplegic migraine

DR. R. P. MACKAY presented the man whose case is recorded in the paper published on page 889 of the November issue of this Journal.

Discussion. DR. FRANK BRAWLEY said that his examination of this case agreed essentially with that of Dr. Mackay. One or two points might be stressed. After the severe pain came on the patient had violent emesis on an average of every hour; after the serious period of the attack was over and after the ptosis subsided, it required twenty-four hours before the deviation changed. It was a week before function of the upper lid was restored. During the attack it was not possible to work out the visual fields, as vision was so low; visual fields taken two weeks ago showed findings rather typical of hysteria. There was fairly uniform contraction of red, blue and white, with reversed blue and red, and once overlapping. The field for the left eye was somewhat larger in extent than in the defective eye. Had the reversal occurred only in one eye, it might have been assumed there was some loss of sensation in the retina.

DR. CLIFFORD WALKER, Los Angeles, thought it would be possible to obtain any form of color defect during the periods when scintillating scotomata were found, and he would not suppose the findings would be of any great value at that time. The other defects such as hemianopia were characteristic and should be tested with more than one size of disc. Diminished visual angles of test object down to two minutes in size often gave a good check on the fluctuating color fields so far as field defect was concerned. Color interlacing had been found in such a variety of conditions and even in normal fields by Ferree and Rand, that its value was questionable.

DR. WILLIAM WILDER had seen a few cases of recurrent attacks of paralysis of the third nerve lasting in some instances for a week or more, and as the condition passed off without any particular medication and there was no evidence of syphilitic origin, the assumption was that the palsy was due to a spasm of the terminal artery supplying the nucleus of the nerve, or possibly an edema pressing upon the various fibers at the points of exit at the base. He had seen few cases of typical migraine, but many cases of headache of migrainous character which lacked some of the features that would stamp them as typical migraine. Ophthalmologists were not inclined nowadays to regard true migraine as due to any refractive error or strain of the muscles of the eyes; although in the atypical cases it would seem that eye-strain played some important part, at least in the aggravation of attacks. While eye-strain might not be considered an essential cause of such headaches, however, it should be removed by proper correction of any error of refraction, just as one would remove any other recognized source of irritation.

DR. PETER KRONFELD thought that it should be possible to localize the lesion in Dr. Mackay's patient. It was most probably in the right middle fossa, in which case it could not be a vascular disturbance because a vascular lesion in the middle fossa involving the optic nerve was practically impossible. It therefore must be an organic lesion. He

had seen cases in which only the third nerve was involved; this one involved the second, third, fourth, and fifth nerves. In his opinion the patient should be kept under observation and repeated examinations made until the lesion was localized.

DR. R. P. MACKAY (closing) said that in diagnosing ophthalmoplegic migraine some of the characteristics of the individual's constitution should be insisted upon. These included the high strung character of the individual "living on his nerve", the periodicity, the tendency toward visual scotomata, nausea, vomiting, depression, relief by pressure over the site of the pain, susceptibility to train sickness, and so on. In trying to distinguish between true ophthalmoplegic migraine and the "lesser types", if one restricted the diagnosis to those cases appearing to be typical of the migrainous constitution mistakes would be infrequent. As for the cases with the mental changes sometimes seen in migraine, each must be treated individually. The diagnosis of migraine was always a matter of opinion. In some cases there would be no disagreement; others were open to discussion.

He agreed in the main with Dr. Kronfeld, but felt that though an organic lesion might be present, something must explain the phasic character of the symptoms. An organic lesion not sufficient to paralyze might place the nerve nearer the border of incompetence, rendering it especially liable to damage by the migrainous process. No organic lesion could be found in this patient. As to the question of the relationship of migraine and epilepsy, he had seen some cases where it was hard to decide which diagnosis to make. Gowers said that he had seen cases which progressed from migraine to epilepsy, but that usually the two conditions were distinct: he had never seen any patients with chills and fever.

Idiopathic hypertension and its ophthalmic findings

DR. GEORGE F. SUKER described the differentiation between the fundus findings in parenchymatous, interstitial, and glomerulous nephritis. He said that the "nephritic fundus" lesions occurred in other hemic diseases, in intracranial lesions, and in certain types of arteriosclerosis; that so-called idiopathic hypertension had in fact an anatomical basis, and was rather complex in its termination; that idiopathic hypertension was prone to involve the fundus early; that the characteristic fundus lesions found in any of the nephritic, cardiovascular, or intracranial diseases had relatively the same anatomic basis; he questioned whether there might not be a specific noxious agent playing a part in the production of this fundus symptomatology.

Discussion. DR. ARTHUR R. ELLIOTT said that in many individuals, in circulatory asthenia, stretching of the arteries occurred and they fell into folds. When the arteries broke down and dilated they might become tortuous, and blood pressure fall. This was cited to emphasize that such conditions might lead observers into a pitfall. Dr. Suker had stated a belief that essential hypertension (idiopathic hypertension) was due to a toxin. That statement was contradictory; it would then be a toxic hypertension and not essential. The old assumption was that it was due to kidney poisons which were retained by the kidneys, sending the blood pressure up or causing vascular tissue changes. The endocrines, focal infections, everything that man's ingenuity could imagine as possibly a cause, had been investigated and found wanting.

The only factor that stood out strikingly was heredity. Investigation of the familial background would show many times a number of individuals in the immediate family with similar conditions. It appeared to be one of the diseases of civilization. Certainly it was on the increase. An individual with a certain vascular inheritance and an inability to withstand the strain under which he was living would develop increased pressure and an enlarged heart, and in the long run organic changes. Possibly it was the same phenomenon which occurred with wo-

men who had spastic colons, finally developing colitis in the course of years.

He agreed with Dr. Suker that in the development of retinal lesions hypertension was the important factor. The difference between the large and small vessels should be taken into account; in the senile type of arteriosclerosis the change was most striking in the large vessels, in the aorta and branches, the brachial, radial, and others, while the arteries and capillaries did not show the same changes, whereas if the smaller (peripheral) order of vessels was mainly involved the systolic pressure must rise to overcome resistance in the peripheral field. Many nephritics presented more or less nutritional lesions in the retina, yet showed a satisfactory kidney efficiency with modern methods of testing.

Dr. William H. Wilder said that a vascular change in the vicinity of the disc was not nearly so suggestive as when seen out further. Loss of transparency was an important sign.

Normally, the walls of the vessels were perfectly transparent; what was seen was the color of the blood inside. When the column of blood seemed to be narrower than the lumen of the vessels should be, it might be due to a degenerative process in the intima of the vessels. This should influence the observer's idea of the size of the blood column. When there was evidence of distinct depression in the vessels, that was a sign of extreme value.

An assertion that certain conditions belonged definitely to certain degrees of tension was utterly without justification. Because evidence of arteriosclerosis was found in the retina, there was no reason to say that the individual had arteriosclerosis in the renal arteries.

If one studied hemorrhages carefully he would usually observe that the flame-shaped hemorrhages were found in the fibrous layers of the retina, sometimes almost on the vessels, whereas the minute hemorrhages were deeper in the retina, where also were found the whitish deposits occurring with fatty degeneration.

Dr. Robert Von der Heydt would emphasize that visual acuity had no relation to the retinal picture as such, because of the fact that the macular area was often spared in these retinal hemorrhages. It having only three layers, the blood did not infiltrate. The lowering of visual acuity was due to vitreous clouding rather than to macular involvement. He showed a series of photographs of hemorrhage in syphilitic retinitis, taken at intervals during the past three years.

Robert Von der Heydt,

WILLS HOSPITAL CLINICAL CONFERENCE

December, 1928

Bilateral coloboma of lens

Dr. F. C. Parker presented a man who gave a history of poor vision since childhood. He had been wearing strong myopic correcting lenses. The personal and family history were negative. There was no external disease. Iridodonesis was to be seen in either eye. Each lens showed a defect in the lower inner quadrant extending in the right, from about four to seven o'clock, and in the left from about four to eight o'clock. Some small opacities in the lens could be seen with the slit lamp. With an ophthalmoscope the existence of high myopia was evident as well as some fine vitreous opacities. Slit lamp study showed zonular fibers extending from the lens margin of the colobomatous section across the open space to their attachment. These fibers were continuations from the posterior capsule, the anterior fibers being missing. The colobomatous margin showed several nodular projections. The vision of each eye was 6/60.

Examination of the nose and throat was negative.

Neuroretinitis complicating pregnancy

Dr. Louis Lehrfeld reported the case of Mrs. M.B., who was seen on June 19, 1928, complaining of blurred vision of the right eye for the past two weeks. Headaches were experienced on read-

ing, and there was some photophobia and lachrymation. The vision of the right eye was 6/60, the left 6/9. Examination of the eyes externally revealed a subacute conjunctivitis. Both pupils were equal, but were sluggish to light. The fundus examination showed in the right eye an advancing neuroretinitis, with a star-shaped figure in the macula. The fundus of the left eye was apparently normal. X-ray examination of the cranial vault showed no evidence of bony disease. The sella turcica had a normal appearance. Transillumination of the frontal and maxillary sinuses revealed no evidence of disease. The nose and throat department reported a chronic tonsillitis. The blood report for lues was negative.

The neuroretinitis progressed to such an extent that the disc was obscured in its entirety, and the star-shaped figure in the macula could not be seen by reason of extensive vitreous opacities. The vision at this time, October 25, 1928, was fingers for the right eye, while the left showed no change. November 22, 1928, the fundus of the right eye was still invisible. The left, however, showed an obscurity of the outline of the inferior pole of the disc. This lack of definition, together with the tortuosity of the veins, was regarded as beginning optic neuritis. At this time the urinalysis showed a faint trace of albumen and occasional narrow hyaline casts. The blood pressure was 105/65.

The patient revealed September 27, 1928, for the first time that she had been pregnant for three months. Inasmuch as the symptoms of the right eye preceded the beginning of pregnancy, obviously the neuroretinitis was not caused by a toxemia of pregnancy. With signs of neuroretinitis affecting the apparently good eye, the problem in this case was whether to permit the patient to continue to full term of pregnancy, or whether the child-bearing period should be terminated. The patient was now under continuous observation, and should the left, or apparently good eye, progress in its inflammatory process, serious consideration would be given to emptying the uterus. Even though the eye symptoms did not originate from the pregnancy, there was a strong possibility that the pregnancy in itself might exaggerate the process involving both eyes. Should, however, the process in the left, or apparently good eye, remain stationary, the patient would be advised not to interrupt the pregnancy.

Toxic amblyopia

DR. THOMAS O'BRIEN presented Mr. G.M., a white miner, aged 38 years. His family history was negative, and previous medical history was negative. Three months ago, the patient stated, he drank three glasses of whiskey. A day later he noticed a diminution in his sight, and three days later went blind. His companion likewise had the same complaint, and he too, three days later went blind. The patient was admitted to the hospital on November 21, 1928. Visual acuity was doubtful light perception. The pupils did not react to light or accommodation. Ocular movements were full. Tension was 40 (McLean). Media were clear, discs round, edges well defined, with a marked excavation of the discs in the center, much like a glaucomatous cup. Capillarity was poor. Maculae were negative. Retinae were dark blue. Fields were unobtainable. Urine examination was negative. Dental examination showed an unhygienic mouth. Five teeth were to be extracted. This was done November 24, 1928. Nose and throat examination showed small and buried tonsils, and slight chronic infection. There was some crusting all through the nose on both sides. Frontal and maxillary sinuses did not transilluminate well. Wassermann was negative. Diagnosis was toxic optic atrophy. Treatment, consisting in pilocarpine sweats, strychnine sulphate, purgation, negative galvanism and potassium iodide resulted in no change in the condition.

Traumatic ectopia lentis

DR. BURTON CHANCE showed a lad who came to the hospital for the removal of

a floating crystalline lens. This lenticular detachment had followed a blow on the eye. As the eye was quite tender it was deemed wise to quiet it by the removal of the lens. The hyaloid had been ruptured so that the aqueous contained vitreous. In looping the lens the globe collapsed to such an extent that the scleral section covered the cornea. For many days this state continued. At present the globe had become spherical, the sclera had united at the line of the incision and it was possible to see the details of the fundus. There were no signs of retinal detachment, and the man saw as well as he did before the operation.

Chronic glaucoma

DR. WARREN S. REESE presented from Dr. L. F. Appleman's clinic a patient who had chronic glaucoma, and was of interest from the fact that he was only twenty-eight years old and also from the unusual conditions that he presented. Dr. Appleman did an iridectomy on the right eye and later a trephining. The right disc was of an anomalous type with a very definite glaucomatous cupping. The vision in this eye had been bad all his life. The left eye showed what looked like a coloboma below but what was really a posterior synechia, probably congenital. There was also an anterior capsular opacity in the upper part of the pupil, and the iris was bunched up and caught below, where it was adherent to the lens. Both corneas were small as usual in glaucoma. It was interesting to speculate as to whether the posterior synechia in the left eye might have acted in the same manner as an iridotasis operation, resulting in freeing of the angle of the anterior chamber above, and thus staving off the glaucoma in the left eye. His vision in the right eye was light perception and in the left 6/12.

Acute retrobulbar neuritis

DR. M. MARCOVE described the case of a patient who entered the hospital on the service of Dr. J. Milton Griscom, November 5, 1928, complaining of failure of vision in the right eye. Her history at this time revealed that she had suddenly lost the sight in the eye about two weeks previously. There was no pain or inflammatory symptom at this time, nor had she noticed any decrease in vision before this but she complained of "fullness and heaviness" of the right supraorbital region. There were no headaches. She was treated by a local doctor who told her she had an inflammation of the nose for which he was treating her. She had had considerable trouble with her teeth but had received no treatment. About three years ago she saw colored rings about bright lights with the right eye but not with the left eye. This phenomenon returned at irregular intervals always in this eye. During the past year it had not recurred but a few weeks ago it returned. There had been no pain at these times.

Examination at this time showed the right eye to be essentially negative externally. The media were clear, disc round, margins slightly blurred on the nasal side, some hyperemia but no swelling of disc itself. The veins were somewhat distended, especially the superior nasal. There was a small white nonpigmented spot about one disc diameter below the macula. This appeared to be in the choroid. No other lesions were seen. The left eye was essentially negative. Vision at this time was, O.D. hand movements; light perception and projection good; O.S. 15/20. Tension was normal. Urine examination on two occasions was negative and blood pressure normal. Wassermann was negative. Dental examination showed five infected roots, two of which were removed on November 7 and the remaining three on November 14. Nose and throat report revealed enlarged, slightly infected tonsils. Air passages on both sides of the nose were narrowed by hypertrophy of both inferior turbinates; no pus was seen. X-ray report eliminated sinus infection. Feeling that because the condition was unilateral some local focus might be present, an exploratory puncture of the ethmoids was done, but no infection was found.

The disc margins became more blurred, the hyperemia more marked and the veins more distended and tortuous, but no hemorrhages were seen. These signs continued to progress until the remaining three infected teeth were removed. Coincident with this the blurring and hyperemia of the disc gradually subsided and the veins became less distended. The visual acuity also began to increase until at present it was 15/15 in each eye.

The field studies have been significant, starting with a large absolute central scotoma which broke through to the periphery, increasing in size until the teeth were removed and then slowly shrinking again until it became paracentral and finally disappeared entirely. The form and color field had increased in size until now it was only slightly contracted. The blind spot also, which at first was enlarged, had returned again to normal.

Medication had consisted only in giving potassium iodide three times daily and strychnine sulphate gr. 1/60 three times daily. Although it could not be definitely stated that the teeth were the specific focus in this case, nevertheless, the fact that the improvement seemed to date directly from their removal caused one to consider this a case of acute retrobulbar neuritis with the teeth as the etiological factor.

Iris cysts

DR. PERCE DELONG reported pathological cases of cysts of iris, showing the five different varieties.

FRANK C. PARKER, *Secretary*

WILLS HOSPITAL CLINICAL CONFERENCE

January, 1929

Pseudoglioma

DR. MAX GABRIO exhibited a case following meningitis.

Asteroid hyalitis

DR. A. BARLOW presented the case of J.D., male, aged fifty-eight years, who was admitted to the clinic on December 12, 1928, complaining of poor vision. Ophthalmoscopic examination of the right eye revealed numerous minute circular floating bodies in the vitreous. They were of a dull white or creamy color, and moved slowly and heavily with the movements of the eye. Some of these globules appeared to have irregular surfaces, and many of them were arranged in vertical rows like chains of streptococci. The optic disc had a peculiar lemon-yellow tinge. The retinal arteries were moderately constricted (normal for the age). The fundus appeared negative otherwise.

Media of the left eye were clear; disc, vessels and fundus were about the same as in the right eye. Vision with correction was 20/30 right and 20/40 left.

Wassermann and urinalyses were negative, blood pressure was 150/90. The fields were suggestive of incipient optic atrophy.

Asteroid hyalitis was first described in 1894 by Benson to whom these shining particles appeared like stars on a clear night. To Holloway, these tiny bodies appeared like snowballs and he therefore liked to refer to this condition as snowball opacities of the vitreous. Asteroid hyalitis must be differentiated from synchisis scintillans. The opacities in synchisis scintillans are composed mainly of cholesterin crystals, while in asteroid hyalitis in the only case examined microscopically (by Verhoeff in 1919) the opacities consisted chiefly of calcium soaps, calcium carbonate, and certain amounts of fatty or lipoid substances.

Spasm of superior recti

DR. WARREN S. REESE presented a patient from the clinic of Dr. L. F. Appleman. This patient had an attack of spasm of the superior recti of each eye while in the clinic, and could not get his eyes down for two or three minutes. He had no convergence and some weakness of accommodation, and his gait and general bearing were of the Parkinsonian type. Wassermann was negative; Meinicke very faintly positive. There were definite signs of syphilis. Neurologic diagnosis was chronic encephalitis with oculogyric crises.

Uveitis

DR. WARREN REESE showed a patient who had an unusual type of uveitis, in that there was an interstitial opacity in the lower part of the cornea, which with the slitlamp could be seen in front of the endothelium. Dr. Reese said that such corneal involvement was fairly common, especially in colored people. Apparently in this case the tonsils were the offending members.

Persistent hyaloid artery containing blood

DR. G. J. DUBLIN demonstrated this twenty-two-year-old patient from the clinic of Dr. B. F. Baer. The chief complaint was redness of the right eye with pain for the previous two weeks. Examination disclosed a typical phlyctenule of tuberculous origin on the bulbar conjunctiva near seven o'clock, and scarred cornea of both eyes probably due to old phlyctenular keratitis.

Media in both eyes showed tubular masses in the vitreous, that in the left eye being much further back than that in the right. In the left the mass was freely movable and always came to rest at the same point and appeared adherent to the disc at seven o'clock. The hyaloid canal remnant in the left eye contained a red mass which at first glance appeared to be a hemorrhagic area in the vitreous. On close inspection, however, the outlines of remains of the hyaloid artery could be made out, with its content of blood. This opinion was confirmed by the slitlamp appearance of the mass. No other congenital anomaly was seen in either eye.

FRANK C. PARKER, Secretary

THE BALTIMORE CITY MEDICAL SOCIETY

Section on Ophthalmology

April 15, 1929

DR. CLYDE A. CLAPP, president

The newer forms of ophthalmic lenses

DR. ALFRED COWAN pointed out that the continued use of flat lenses for more than five hundred years after the invention of spectacles was not because the deeper forms were not known and appreciated, but because, with the small lenses in use until comparatively recent times, there was no actual need for the better forms of ophthalmic lenses. The astigmatism of oblique pencils was scarcely noticeable in such small lenses. With the increase in the size of spectacle lenses, however, the better definition toward the margins of the deeply curved lenses has made them more and more popular until, at the present time, probably ninety per cent of all spectacle lenses are deeply curved.

Lately, several enterprising manufacturers have designed what each professes to be the ideal ophthalmic lens; but every well informed ophthalmologist knows that not only are many of the properties claimed for these lenses impossible, but that they are not even necessary in an ophthalmic lens.

No two of these patented, trademarked lenses are alike, as is to be expected. The best form of ophthalmic lens must, of necessity, be a compromise, and from the practical standpoint a lens with a —6D. base-curve, in the ordinary powers, will fill the requirements of an ophthalmic lens.

New hand illuminating lamp

DR. H. F. PIERCE, PH.D., (by invitation) demonstrated a new operating lamp for use either on a stand or as a hand lamp. The advantages of the lamp as demonstrated were: lightness, smooth outer surface, with few projections to retain dirt or catch garments, and a clear even light over the area illuminated, with no possibility of projecting an image of the filament on to the field of operation.

Objective refractometers for the eye

DR. JONAS S. FRIEDENWALD said that the first attempt to modify the ophthalmoscope, so as to use it as a means for determining the refraction of the observed eye, followed shortly after the invention of the instrument, when Rekoss, instrument maker for Helmholtz, inserted a disc of lenses, the so-called Rekoss disc, onto the Helmholtz ophthalmoscope. By choosing the lens

with which the best image of the observed fundus could be obtained, and by allowing for the refractive error of the observer, an estimation of the refractive error of the observed eye could be made. This might be spoken of as direct ophthalmoscopic refractometry. The error in this method, as was well known, was upwards of one diopter even in the most skilled hands. A recent refinement of this method was that devised by the speaker through the calibration of the simplified Gullstrand ophthalmoscope. Here, with the binocular eye piece to aid in abolishing the accommodation of the observer, tests could be made with an accuracy of one half to one diopter.

Shortly after the invention of the Rekoss disc, indirect ophthalmoscopy was developed, and Schmidt-Rimpler soon devised a method by which indirect ophthalmoscopy could be used to estimate refraction. He projected the image of an illuminated test object upon the patient's fundus, adjusted this image to the sharpest focus and read off the refractive error from the setting of his target and lenses. This method proved to be crude and inaccurate, but it was the parent of many similar attempts. The idea seemed to be singularly attractive and hardly a year has passed without some new device along the same lines. Most instruments of this type used a perforated mirror with which to project the image upon the observed fundus. This had a double disadvantage. Since the periphery of the pupil was used in projecting the image and since the optical aberrations of the periphery of the pupil were great, a sharply focussed image could rarely be obtained. Furthermore, the refraction at the periphery of the pupil differed by an inconstant and generally unknown amount from that at the axis. The accuracy of these instruments could, therefore, never be expected to exceed one half diopter error. The latest development of this method was that of Thorner who had applied the principles of reflexless ophthalmoscopy to his instrument in such a fashion that one-half of the patient's pupil was used for throwing the image of a test object upon his retina and the other half was used for observing that image. Furthermore, the illuminating system and observing system were so constructed that they were simultaneously focussed by the movement of the same screw. In this instrument, however, it was still mainly the periphery of the pupil that was used both for image formation and for observation. The criticisms previously made, therefore, held in this case as in those previously mentioned.

The speaker then demonstrated his own refractometer which made use of the same principle, casting the image of a test object upon the fundus and observing the sharpness of that image. The instrument was so arranged, however, that the central portion of the pupil was used both for the illuminating and the observing systems. The corneal and lenticular reflection was abolished by polarizing the light of the illuminating system in one direction, that of observing system in the opposite direction. This device had been suggested to the speaker by Professor Pfund and proved highly effective in eliminating the glare of the corneal and lenticular reflection. In addition a color filter was inserted in the illuminating system to reduce the chromatic aberration of the image and also the halation of the image from diffusion of the light through the choroid. As in Thorner's instrument focussing of both the illuminating and observing systems was accomplished simultaneously by the movement of the same screw. The accuracy attainable with this instrument could not yet be estimated, but on theoretical grounds should exceed that of any other similar method based upon the projection of an image of a test object upon the retina.

The speaker then took up the question of parallax refractometry. While heartily endorsing the great usefulness of skiascopy, he pointed out that this method also entailed the use of the periphery of the pupil and therefore, when the spherical aberration of the patient's eye was unusually great, led to inaccurate results. Experienced skia-

scopists could usually recognize these cases and discount the accuracy of their readings accordingly. The Henker refractionometer, the latest development in parallax refractometry, also used the periphery of the pupil for the projection of the image on the patient's retina. The instrument was beautifully and delicately constructed so that the image might be focussed with a high degree of precision, but when the spherical aberration of the observed eye was large the readings were highly inaccurate, though the observer had no way, as in skiascopy, of judging their accuracy. The speaker, therefore, preferred the old fashioned retinoscope to this elaborate instrument.

AARON ROBINSON, Secretary

KANSAS CITY SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

September 19, 1929

DR. L. R. FORGRAVE presiding

Subconjunctival iridectomy for simple glaucoma

DR. LAWRENCE POST read a paper on this subject which will be published in full in this Journal.

Discussion. DR. J. WALLACE BIEL asked why the author did not use novocain and adrenalin instead of cocain for subconjunctival injection.

DR. A. N. LEMOINE welcomed Dr. Post's new operation for glaucoma because it apparently overcame the two greatest disadvantages of the best operation we now had for chronic simple glaucoma (the Elliot trephine operation); that is, hypotension and secondary infections. In fact except for a few cases of absolute glaucoma, the only failures he had had were the result of hypotension in four cases, and secondary infection in one case, out of about 80 or 85 eyes.

DR. A. W. MCALISTER, JR. said that in doing an iridectomy under a conjunctival flap he made his incision as far forward subconjunctivally as possible. Since the corneal tissues did not reunite readily one was more likely to get permanent filtration.

DR. E. E. PICKENS remarked that no operation for glaucoma was uniformly good, and that in a large clinic he had seen only one patient that really had been cured by any of the various forms of operation. One eye in this patient had an iridectomy and the other eye an iridotomy.

DR. H. HEDRICK mentioned that when Dr. A. Greenwood operated at their clinic last spring, he likewise advocated having the epithelial layer of the iris forward for the same reason that Dr. Post advised it.

DR. LAWRENCE POST, closing, said that he preferred cocain for the subconjunctival injection because of its stronger and quicker action and felt that the injection of one drop of a five per cent solution was without danger.

ALBERT N. LEMOINE, Recorder

American Journal of Ophthalmology

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CAN MEDICAL PRACTICE BE STANDARDIZED?

The points of view of two classes of people occupying the respective positions of an interdependent relationship can never quite agree. Thus teacher and scholar are not likely to assume identical attitudes toward certain problems in regard to which one is the leader and the other the more or less willing and obedient follower. Even clergyman and congregation will be critical of one another and will often display conflicting standards of thought and conduct. The extremes of wealth assume the existence of poverty, and rich and poor cannot fail to develop discordant viewpoints on many phases of life.

It is doubtful whether one who has practiced medicine for years or a lifetime can ever know exactly the position which he and his art occupy in the minds of the laity; and the majority of patients are far from seeing eye to eye with us concerning certain aspects of the professional relationship which have become as the fiber of our existence.

As dictated by the physician's ideals, or by the absence of them, the community at large is either humanity in need of help or a mass of material which awaits exploitation. The kind of skill required in the fulfilment of humanitarian motives is not quite the same as that demanded in the exploitation of a field of commercial enterprise. Here lies the difference between the essentially professional and the typically business outlook, but it is not to be supposed that most physicians will display one of these attitudes to the entire exclusion of the other.

The saving grace in the physician is to think of himself as the patient. "Given the knowledge that I possess, as to health and disease, as to the uncertainties of treatment, as to the risks of life and death, as to the preciousness of this or that organ in its natural integrity or as modified by surgical skill or bungling, how should I like to have this par-

ticular problem treated, what risks should I care to assume, into whose hands should I prefer to commit myself, and what standards of training should I demand in those who assumed responsibility for my physical well-being?" Or "What should I want done if this particular problem arose in one of my family?"

Looking at the question frankly, the physician would often demand for himself something better than he gives his patients. He would wish for extreme care, extreme skill, the minimum of risk which the circumstances would allow, and above all he would demand that the physician or surgeon whom he employed was not one of mediocre training even if this were the usual quality of professional training in the community in which he lived, but rather a physician of the best training, one with the highest standards of education and equipment in the applied science of medicine or in the special branch of medicine involved.

These considerations should influence our decisions as to what is to be done to the patient, our advice to him, our recommendation for consultation with professional colleagues.

How far have we gone toward real standardization of the practice of medicine as a whole or in any of its specialties? Not, it is to be feared, very far. The graduate of a medical college, wide though the scope of his study has become, and making due allowance for the fact that he can not possibly master all technique in all the specialties, too often steps out into the active practice of medicine without proper knowledge of many important specialized details of technique which it should have been practicable for him to acquire, and the understanding of which by the general practitioner is highly desirable for the welfare of the patient. For example, under proper teaching, it is not difficult to impart to the undergraduate a valuable basic understanding of the use of the ophthalmoscope, yet how many of the medical graduates of this or any other country carry such understanding with them into their practice?

The more dependent the profession and the community become upon the administrations of specialists in various branches, the more necessary it is that any physician recognized as practicing a given specialty shall be reliable in knowledge and practice. Yet it is in regard to special practice that the most flagrant disregard of the principles of standardization exists.

Several reasons hinder adequate standardization of those who in one way or another hold themselves out as practicing specialties within the field of medicine. One is the unwillingness of the physician to make the necessary expenditure of time, money, and effort to equip himself; a second is the fact that inadequate provision is made for furnishing the training which he needs; and a third is the fear, too often present in the individual, that requirements for standardization would deprive him of more or less tangible special privileges which he enjoys in the community, but which are based upon the relatively inadequate fact that he has a medical diploma and a license to practice medicine, neither of which testifies to his ability to perform in a field of specialization.

How many of those who undertake intraabdominal operations could demonstrate before a strict but fair and impartial board of surgical examiners that they possessed the training which the health and safety of their patients demand? How high a percentage of rhinologists in country towns or even in the larger cities could show a thorough acquaintance with the intricate anatomy, the diagnosis, and the delicate surgery of the nose, the nasal sinuses, the larynx and the ear? Coming nearer home, how far have we really gone in the establishment of reliable standards of ophthalmic practice?

It is true that the American Board for Ophthalmic Examinations, supported by the three important national bodies devoted to this specialty, was the pioneer in standardization of special practice in this country. It is also true that the activities of the Board, particularly in relation to the requirements of the

American Ophthalmological Society and of the American Academy of Ophthalmology and Otolaryngology, have materially advanced the cause of standardization in preparation for ophthalmic practice. But the road is only just begun.

Ultimately, it is probable that no one will be allowed to hold himself out as a specialist in any well defined branch of medicine and surgery without having presented clearly authenticated evidence of a minimum period of training in an institution properly equipped and designed to furnish this kind of postgraduate study, and without having shown a satisfactory aptitude in mastering the necessary details of information and technique.

It will not be sufficient for the candidate to state that he has attended such an institution or that he has acted as assistant to some reputable practitioner of the specialty. He will have to present credits just as rigidly established as those which are carried from high school to college or from one university to another.

This will involve the naming of institutions whose courses of postgraduate study and whose demands upon the postgraduate student are officially recognized as satisfactory; and this in turn will require creation of teaching staffs of acknowledged efficiency. It will further demand, on the part of the community or of the individual or of both, the expenditure of far more money than is now being applied specifically to postgraduate teaching and study.

In ophthalmology, such official requirements for standardization might well result in the creation of accepted text books dealing with individual phases of the subject, such as refraction, ophthalmoscopy, perimetry, ocular histology and pathology, and ocular surgery. It might involve organized cooperation between a national examining body (representing perhaps conjointly the leading institutions for ophthalmologic education and the leading ophthalmologic societies) and the licensing boards of the separate states. It might lead to the development of a group of teachers in ophthalmology whose activities were definitely aimed at meeting educational requirements for special practice.

We have already travelled far in procedure, although not so far in the lapse of years, from the days when no single state of this Union demanded a license for the legal practice of general medicine. The proposal to require a special license for special practice will be subject to much criticism, and is likely to be slow of adoption. It could not fairly be made retroactive, and would have to be limited to the new generation of specialists. But such a development is a need of our modern age, will prove an essential basis of continued public confidence in the profession of the healing art, and would place the practice of ophthalmology upon an even higher plane than it occupies today.

W. H. Crisp.

THE UNKNOWN IN GLAUCOMA

In his introduction to the English translation of the Life of Pasteur, by Valléry-Radot, Sir William Osler wrote: "The Greek physicians, Hippocrates, Galen, and Aretæus, gave excellent accounts of many diseases; for example, the forms of malaria. They knew, too, very well, their modes of termination, and the art of prognosis was studied carefully. But of the actual causes of disease they knew little or nothing, and any glimmerings of truth were obscured in a cloud of theory." It is not strange that with regard to glaucoma a knowledge, first of the pain and blindness it causes, and then of the changes left in the optic nerve and eyeball, when it has run its course, should have preceded any knowledge of its "actual causes."

In spite of its grave prognosis, general ignorance of glaucoma has stood in the way of early recognition. The study of the pathologic anatomy of eyes removed after they had become entirely blind from glaucoma has tended to fix attention on the late results of the disease; while its early manifestations and course have been ignored or forgot-

ten. This attitude has been confirmed by the fact that in certain parts of the world, as in India and Egypt, most cases of glaucoma have not been seen until one or both eyes had become blind, and under circumstances in which no remedy but operation could be considered.

For these reasons Laqueur's complete history of his own case, first published after his death, is worth republishing. (See page 984 of this issue.) In it the earliest symptoms and course are emphasized, and also the important fact that not all cases of increased intraocular tension end in blindness. Other cases of glaucoma that did not end in blindness may be found scattered in medical literature, some of them reported by quite competent observers. Each ophthalmologist of large experience has probably seen one or more of them; although they have not made so much impression as one dramatic case that went on to blindness in spite of all treatment, like that of Javal. The case of Laqueur is perhaps the best observed case of its kind; and it is sufficiently striking to make a deep impression. Enough similar cases are now recorded to show that the belief that glaucoma invariably means operation is not well founded; and when their significance is understood many more will be reported. When it is known that glaucoma may recover without operation, its causation and the influences that work for a balance of intraocular tension will receive more accurate attention, and the assembling of facts heretofore overlooked will point the way to a better mastery of the disease. *Edward Jackson.*

THE AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

A few years ago even the most sanguine friends of the American Academy of Ophthalmology and Otolaryngology could scarcely have foreseen its present development. A democratic and inclusive organization, with no bounds to its membership other than those established by the educational and professional qualifications of the candidates, it has grown amazingly, and today, in numbers, financial strength, and vigorous initiative for the good of the community and of the profession, it is perhaps the most significant association of medical specialists in the world.

The Academy's vigorous championship of the standards of special practice established by the two national examining boards, the American Board for Ophthalmic Examinations and the American Board of Otolaryngology, has seemingly in no way diminished, but rather stimulated, the desire of the younger generation of ophthalmologists and otolaryngologists to be counted among its members. In relation to the date and place of meeting of the Academy, the ophthalmologic board alone, sitting on October nineteenth in New York City and on October twenty-first in Philadelphia, examined somewhere near seventy candidates for certification, most of whom were applicants for membership in the Academy.

The preparation of the Academy's program of scientific papers has been somewhat hampered by the very general exodus of ophthalmologists to Europe in connection with the International Congress at Amsterdam; yet a very worthy series of contributions was presented. It was a matter of rather general comment that the papers were discussed less freely than was desirable or than had been the case in earlier years. Several reasons were suggested to account for this, including the large size of the meeting hall, a certain amount of difficulty involved in sending discussion cards forward to the platform, and the idea that the publishing of a presessional volume might have reduced instead of stimulating interest in the actual presentation of the papers. One well-known member suggested that in subsequent years there might be some virtue in allowing those taking part in discussion to speak to one or other of several microphones to be conveniently placed throughout the meeting hall.

The Academy has been and still is particularly fortunate in its executive

officers. Dr. Wherry's very business-like administration of the affairs of the organization, and particularly of the plans for the annual meeting, has earned the warmest congratulations from his fellow members; and the ophthalmologists of the Academy are indebted to Dr. Benedict for so successfully overcoming the special difficulties which this year existed in regard to the preparation of the program of scientific papers.

Perhaps the most striking development in the activities of the Academy in recent years is that part of the program for which the Secretary for Instruction is made responsible. There is something inspiring in the mental picture of some hundreds of ophthalmologists and otolaryngologists, gathered from all parts of the United States and Canada, distributing themselves for two consecutive periods on each of three mornings, in groups of twenty or less, to take part in conferences on over fifty different topics, led by men who have devoted particular attention to "specialties within specialties." Only one warning is perhaps in order, and that is that each leader of a conference should not fail to leave an appreciable part of the hour and a half allotted to him open for the "conference" feature of the plan, in other words for general discussion and exchange of individual views among those present.

A new feature of this meeting, which as regards the ophthalmologic branch was not so well attended as its presentation deserved, was a review of "recent advances," particularly well handled as to diagnosis and pathology by Dr. McKee and as to medical and surgical treatment by Dr. Bahn. It is unfortunate, although perhaps inevitable, that whatever is placed last on the program suffers from the rapidly increasing migration homeward.

W. H. Crisp.

BOOK NOTICES

The pathology of the eye. By Jonas S. Friedenwald, M.D., associate in pathological ophthalmology at the Johns Hopkins University, pathologist of the Wilmer Ophthalmological Institute of the Johns Hopkins University and Hospital. Octavo, cloth bound, 346 pages, on plate paper. Illustrated with 253 figures, mainly microphotographs from the pathological collections of the Wilmer Ophthalmological Institute and the Army Medical Museum, by Helenor Campbell, New York, The Macmillan Company, 1929. Price $4.50.

It is upon a combined understanding of pathology, diagnosis, and therapy that successful practice must be conducted. Too often diagnosis and therapy have been studied or taught without adequate attention to pathology. The successive examinations conducted by the American Board for Ophthalmic Examinations have revealed an increasing earnestness and thoroughness in the study of pathology on the part of those who face these examinations; in spite of the fact that adequate and up-to-date textbooks on this subject were hard to find, at least in the English language. Here is a volume which is likely at once to assume a leading position in the study of ocular pathology.

Publisher and author alike are to be congratulated most heartily upon this valuable work. Its 253 beautiful illustrations (for the preparation of which Miss Helenor Campbell is justly given credit by the author) round out the text in such a way as to provide a splendid basis for either teaching or group study. The microscopic details are reproduced flawlessly and with remarkable wealth of fine detail, unerringly selected for demonstration of the points brought out in the text. Much valuable material has been derived from the increasingly important eye collection of the Army Medical Museum, under Major Callender.

The book is described by the author as the outcome of a course of lectures prepared some years ago for the instruction of medical students and surgical house officers in the department of ophthalmology of the Johns Hopkins Medical School and Hospital. It will

add renown to the Wilmer Ophthalmological Institute, of whose staff the author is an important member and with the date of whose official dedication the appearance of this volume so nearly coincides.

"The aim is rather to form a bridge leading from general pathology to this special field. . . . ." Admirable emphasis has been laid upon the reactions of different parts of the eye to similar injuries and disease processes and the frequent similarity between ocular disease and disease of other organs; and it is interesting to note that the author feels that this orderly presentation has led to a considerable condensation of the text. The work opens with a concise review of ocular anatomy and physiology.

Repeatedly, throughout the various chapters, one encounters the author's original observations and deductions, often not hitherto published. Certain results of experimental researches on the rate of secretion of the aqueous, on the pathogenesis of wood alcohol blindness, and on the relation between cataract and vitamin deficiency here find publication for the first time.

The list of chapters follows: (1) Introduction; (2) Ocular inflammations, panophthalmitis, and phthisis bulbi; (3) Ocular inflammations (continued). Focal lesions; (4) Ocular inflammations (continued). Specific infections; (5) Injuries of the eye; (6) Cataract; (7) Glaucoma, hypotension, and detachment of the retina; (8) Senile changes and arteriosclerosis; (9) Choked disc and albuminuric retinitis; (10) Diseases of metabolism, of nutrition, of the blood, of the endocrine glands, and of the bones; (11) Diseases of the cornea and conjunctiva; (12) Diseases of the ocular adnexa; (13) Normal variations, congenital anomalies; (14) Hereditary diseases; (15) Tumors. A useful appendix on microscopic technique is added, and most of the chapters are accompanied by lists of references.

The author does not hesitate frankly to state his views where these do not altogether coincide with the opinions of others, or where he leans to one out of a variety of conflicting interpretations of the evidence. In the chapter on focal lesions we find the following: "Our knowledge of the etiology of iritis, cyclitis, and choroiditis is at present much confused. Certain cases are clearly due to specific infections—syphilis, tuberculosis, etc. . . . . In the nonspecific cases bacteria cannot be demonstrated in the lesions. These cases have in general been attributed to focal infection of the teeth, tonsils, nasal sinuses, gall bladder, gastro-intestinal and genito-urinary tracts, but definite proof of the causal relationship is lacking. In some instances striking improvement is seen following treatment of the alleged focus, but equally striking improvement has been obtained in a limited number of cases with parenteral injections of foreign protein, and with other forms of therapy. Those who believe in the theory of focal infection explain its therapeutic failures by assuming that some undiscoverable focus of infection exists within the human body. If this were true, we would expect to find at autopsy, in a considerable number of cases, hidden foci of infection which have given no clinical evidence of their presence, but such hidden infections are not found at autopsy . . . . the one thing that can be said with certainty about the etiology of these intraocular inflammatory troubles is that it must be in some way related to the etiology of certain forms of iritis, for the association of these two conditions is far too frequent to be merely accidental." *W. H. Crisp.*

Der Faserverlauf durch das Chiasma und die intrakraniellen Sehnerven. (The course of the fibers through the chiasm and the intracranial optic nerve). By Hermann Wilbrand, Hamburg. Cloth octavo, 54 pages, 44 illustrations. Berlin, S. Karger, 1929. Price 12 marks.

Although Newton in 1704 raised the question of a semidecussation of fibers in the optic chiasm, at the beginning of

the nineteenth century it was still generally believed that the decussation was complete in the human. The end of the nineteenth century saw many investigators tracing the course of the fibers in the chiasm. The arrangement in alternating layers of the crossed portions of both nerves, the interlacing of the crossed and uncrossed nerve bundles, and the varying direction of the fiber bundles in various parts of the chiasm make this complicated course of the nerve fibers very difficult of study.

The author states that the course of the fibers can be demonstrated accurately only in a chiasm unaltered macroscopically, with complete atrophy of one optic nerve; in such a specimen it is possible to trace the crossed and uncrossed portions of the intact nerve. For this reason the beautiful drawings by means of which the author demonstrates the course of the fibers in the chiasm are very interesting and instructive; they represent forty-four microscopic sections of the chiasm projected on a drawing apparatus. The descriptive text is very brief.

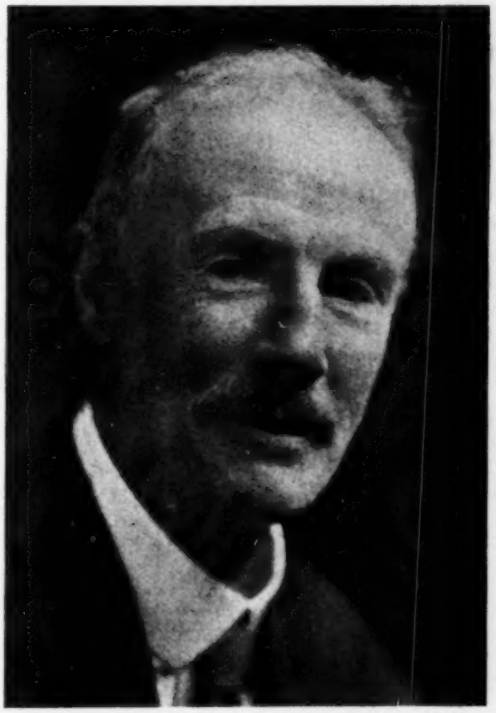
In regard to the diagnostic points the author mentions a double central temporal hemianopic scotoma with progressive loss of the entire temporal field due to a lesion in the floor of the third ventricle encroaching on the chiasm; blindness in one eye and temporal hemianopsia in the other due to a lesion of one-half of the chiasm; temporal hemianopsia followed by a central scotoma caused by a lesion in the center of the chiasm extending laterally; homonymous hemianopsia followed by blindness in one eye as indicative of disease of one optic tract extending into the chiasm of the same side; optic atrophy of one eye with progressive loss of central vision and gradual development of a temporal hemianopsia in the other eye, the result of disease progressing centrally from the nerve into the chiasm; and upper temporal quadrant anopsia, often the precursor of a complete temporal hemianopsia, in tumors extending from the hypophysis.

Ray K. Daily.

OBITUARY

Edward Erskine Henderson

Although Edward Erskine Henderson wrote very few original articles and was not widely known to American ophthalmologists as a surgeon or clinician, he rendered conspicuous service to ophthalmology as editor of the Ophthalmic Review from 1910 to 1916



EDWARD ERSKINE HENDERSON, 1870-1929

inclusive, as subeditor of the British Journal of Ophthalmology under Sydney Stephenson, from 1917 to the latter's death in 1923, and after that date as senior editor of the British Journal of Ophthalmology.

From an early age he suffered from deafness, and although this fact seems not to have interfered seriously with his education at Harrow, St. John's College (Cambridge), and Guy's Hospital, or with successful medical practice at Shanghai, China, it did handicap him in the race for clinical appointments after he had taken up ophthalmology in 1898.

He worked at Moorfields Hospital for fifteen years, was an excellent operator, a good clinician, and a stimulating teacher. He retired from practice in 1920. His editorship of the Ophthalmic Review came to an end with the wartime amalgamation of that journal with the Royal London Ophthalmic Hospital Reports and the Ophthalmoscope to form the British Journal of Ophthalmology.

His intimate friend and editorial colleague on the British Journal of Ophthalmology, R. R. James, writes of him: "He will be greatly missed; his critical mind, his shrewd judgment, and his sense of humor made him an ideal colleague. He took the greatest interest in the journal; he improved our English and our punctuation and sat in kindly judgment on our faults." He had engaged actively in various sports, "played a good game of golf, and he was on a fishing holiday in Ireland when he died. He was well read . . . .; he was expert in heraldic matters and he did beautiful work in wood and ivory on the lathe, in which he was entirely self-taught."

ERRATUM

In the paper by Drs. Holloway and De Long in the preceding issue of this Journal (November, 1929), in the fifth line of the second column of page 875, the word "different" should be "diffuse". The sentence will then read: "Fleischer's patient showed a diffuse pigmentation of certain of the internal organs" etc.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, and parasites
18. Hygiene, sociology, education and history

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1. GENERAL METHODS OF DIAGNOSIS

Erggelet, H. **Fundus photography.** Arch. f. Augenh., 1929, v. 100-101, July, p. 402.

Erggelet discusses the value of various lights and the different types of photographic plates in fundus photography. *Frederick C. Cordes.*

Lauber, Hans. **Space-saving arrangement of Bjerrum curtain and improvement in Elliot's scotometer.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 310-314. (2 ill.)

Both apparatus are described and illustrated. *C. Zimmermann.*

Sander, E. **A simple apparatus for measuring the pupillary reaction.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 318-322. (1 ill. and 1 curve.)

For the objective measurement of the pupillary reaction Sander has devised and describes a new apparatus, which avoids the deficiencies of the differential pupilloscope of Hess.

C. Zimmermann.

Thiel, R. **The settling time of the blood corpuscles in diseases of the eye.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 213-220. (3 curves and 2 tables.)

The settling time of the blood corpuscles was increased in rheumatic and luetic eye affections, retarded in the purely tuberculous affections. In acute exudative tuberculous iridocyclitis it was greater than in the benign chronic indurative forms. The settling time is not specific, but as an extra method of examination it is a valuable diagnostic aid, especially in the etiologically different types of iritis. In intraocular diseases (iridocyclitis) it may be a gauge for the healing process and the result of therapy. It may inform the ophthalmic surgeon of the existence of inflammations in other organs, from which a late local postoperative infection may be derived if operation on the eye should be undertaken.

C. Zimmermann.

2. THERAPEUTICS AND OPERATIONS

Gasteiger, H. **The therapeutic use of x-ray in ophthalmology.** Arch. f. Augenh., 1929, v. 100-101, July, p. 352.

Gasteiger discusses in detail the method and dosage of x-ray therapy in various ocular conditions. Lid tumors react well to this therapy, between 50 and 80 per cent responding to treatment. The superficial tumors, particularly, respond well. There is a divided opinion as to the use of x-ray or surgery. Most

men apparently feel that the superficial tumors should be treated conservatively while the deeper ones should be removed and x-rayed later.

In orbital tumors the results are less startling. It is possible to reduce the tumor to some extent and in some cases there is apparently a cure of the condition. The possibility of recurrence and metastasis, however, is great.

Of the intraocular tumors, retinal glioma has received the greatest attention. There seems to be some indication that x-ray therapy may be of value in these cases. One case of retinal glioma that was given x-ray therapy has been observed by Gasteiger for ten years with apparent recession of the tumor and with useful vision.

The epibulbar tumors also belong to the group that responds well to treatment. The treatment of pituitary tumors is discussed. In diseases of the uveal tract, cornea, and sclera, x-ray therapy has a definite place. Sympathetic ophthalmia, tuberculosis, and iridocyclitis all seem to be helped by exposure. *Frederick C. Cordes.*

Löffler, J., and Wellisch, E. **The therapeutic value of ocular diathermy.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 285-296. (4 ill.)

After a review of the literature and description of technic, the authors report their own observations within one year on thirty-one cases of glaucoma, diseases of the optic nerve, retina, choroid, and vitreous. The results were favorable in acute and traumatic opacities of the vitreous, only very limited in the other affections, but the authors consider diathermy as a valuable adjuvant in diseases of the eye and one which deserves further development.
C. Zimmermann.

Monastyrskaja. **Dynamometric measurements of akinesia of the orbicularis muscle.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 306-310. (2 ill. and 1 curve.)

To ascertain the effect of akinesia after injection of from 2 to 5 c.c. of one per cent novocaine, the needle passing to the bone from the temporal lower angle of the orbit in a horizontal and then in a vertical direction, a stop speculum was used whose one branch had a gauged metallic plate, the other a pointer. The best results of akinesia were obtained by injecting four c.c. of one percent novocaine and operating between the fifth and thirteenth minutes after injection. The measurements are given in tabular form. *C. Zimmermann.*

Spiropoulos, C. **Experimental evidence of the bactericidal effect of thorium.** Arch. f. Augenh., 1929, v. 100-101, July, p. 418.

Spiropoulos used thorium in various forms to determine its effect on bacterial growth. Small doses over a period of sixteen hours had no effect; neither did large doses (2000 to 3000 e. s. E.) over a short period (one-half hour). Only large doses over a long period produced any bactericidal effect. Inasmuch as the organisms in the eye are held in secretion or in epithelial cells, the author concluded that thorium would have even less beneficial effect than it has in pure cultures.
Frederick C. Cordes.

Wessely, K. **Avertin anesthesia in ophthalmology.** Arch. f. Augenh., 1929, v. 100-101, July, p. 556.

Wessely used avertin (tribromethyl-alcohol) anesthesia by rectum. It is recommended particularly in children in whom intraocular surgery is necessary. The ideal combination includes the use of some local anesthetic as well. The advantages of the method are that anesthesia is produced by induction of natural sleep. In addition, there is no postoperative nausea or vomiting. In this way the state of excitement and the fear and discomfort of general anesthesia are avoided in cases in which local anesthesia can not be used.
Frederick C. Cordes.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Carlo. **Monocular perception of relief.** Ann. d'Ocul., 1929, Aug., v. 166, pp. 650-654.

There is a qualitative as well as quantitative loss of vision in the one eyed, but there is present a certain depth perception which is dependant on factors derived from experience in handling objects and the perception of lights and shadows. Binocular vision is not the sole element in this question.

Lawrence Post.

Giannantoni, A. **On the importance of exact centering of correcting lenses in ametropia.** Ann. di Ottal., 1929, v. 57, March, p. 206.

The optic axis does not always conform with the visual line. Very properly attention is given to the adjustment of lenses to the pupillary distance, but not always to the visual angle. If the latter adjustment is not correctly made a prismatic effect may result, with the production of an artificial astigmatism from oblique position of the lens. In the higher focal values the prescription of a lens gives an opportunity for correcting disturbances of muscular equilibrium together with refractive errors. By properly decentering the lens a less strength of glass may be employed with better effect than that which completely corrects ametropia.

Park Lewis.

Levinsohn, G. **The anatomy of artificially produced myopia in the ape's eye and its significance in myopia.** Arch. f. Augenh., 1929, v. 100-101, July, p. 130.

The histological preparations used by Levinsohn were derived from apes' eyes which Essed and Soewaine in Java had altered from hyperopia to myopia. This was done by placing young animals in small cages six hours daily in such a position that the normal vertical axis of the head was horizontal. After three months, myopia made its appearance. The animals were treated in this manner for fifteen months before the eyes were studied. With this change in refraction, a large percentage showed the usual myopic ophthalmoscopic changes (temporal conus). The anatomical changes noted were identical with those seen in human axial myopia. The article contains many excellent microphotographs. *Frederick C. Cordes.*

Litinsky, G. A. **Functional asymmetry of the eyes.** Russkii Opht. Jour., 1929, April, pp. 450-466.

A new objective way of determining whether a person is right-eyed or left-eyed has been used by the author on 601 patients of various ages ranging from two to seventy-two years.

The examination was conducted in a dark room, with an electric globe at a distance of from three to five meters as a fixation object. The patient was asked to place his index finger before his eyes and to look at the center of the globe, while the investigator observed the shadow of the finger passing across the patient's leading eye. In 92.6 per cent of all cases examined, the author found a functional prevalence of one eye, notwithstanding the binocular type of vision. This was usually accompanied by a tendency to close the non-leading eye. An attempt was also made to measure the degree of prevalence in diopters, corresponding to the lens which reduced the visual acuity of the leading eye sufficiently to transfer the functional prevalence to the other eye.

No relationship between "eyedness" and "handedness" could be established, except that ten per cent more of left-eyed persons were found among the left-handed than among the right-handed. The author stresses the importance of determining which is the leading eye, in correcting refractive errors and in selecting the eye to be operated upon in cases of bilateral cataract and in those of alternating squint. *M. Beigelman.*

Møller, H. U. **Investigations in dark adaptation with Tscherning's photometric lenses.** Acta Ophth., 1929, v. 7, pts. 1 and 2, pp. 1-145.

The article presents an exhaustive review of the literature on dark adaptation and a report of the author's own investigations, illustrated with charts and tables. The increased sensitivity of the retina in the dark, he terms adaptation, and the lessening of this sensitivity un-

der illumination disadaptation. He prefers these terms to dark and light adaptation, because the latter imply two separate functions. Working under standard illumination the range and time for adaptation and disadaptation should be equal.

The author studied the adaptation of the retina and the various factors influencing it; the sensitivity of the different parts of the retina; the acuity of vision under reduced illumination; and the variations in the intensity of daylight. For the study of adaptation he finds Tscherning's photometric lenses, which he describes in detail, most accurate. They do away with the necessity of cumbersome apparatus and a dark room. To measure the intensity of light he uses Tscherning's lampromeeter. He found that there was a definite range of adaptation for every definite intensity of light. For his own eye the maximum adaptation for a candle light seen from a distance of 50 cm. was a no. 10 photometric lens, which represents 1/10,000,000,000 of candle light. The factors which affect the range of adaptation and the time in which the maximum is reached are the state of adaptation of the eye tested, the size of the pupil, and the size of the object. The author describes the normal adaptation curve; it is not definite but varies with the previous state of adaptation, the effect of which he demonstrates with charts. The power of immediate adaptation is greater in an eye coming out from bright illumination. The dilated pupil differs but slightly from the normal pupil in the dark; the pilocarpin-contracted pupil has the effect of a 0.75 photometric lens in front of the eye. There is no increase in the range of adaptation through binocular effort. In a study of adaptation for red, which is very difficult to demonstrate, the author found that in reduced illumination red was best perceived centrally; that when the light was further reduced it was perceived only centrally; and that the moment when red disappeared marked the beginning of the central physiologic scotoma in the dark and the end of foveal adaptation.

Under reduced illumination the visual fields contract if tested with small objects. The most sensitive portion of the retina is situated twelve degrees nasally at the limit of the physiological central scotoma. As the illumination is raised this scotoma becomes smaller before there is any extension of the peripheral field. The visual field for red becomes contracted to a few degrees around the fixation point. The physiologic scotoma varies with the individual, the illumination, and the adaptation. The author regards the yellow pigment of the fovea as the cause of this scotoma. Under reduced illumination Purkinje's phenomenon is reversed; red is visible centrally while green and blue are not perceived. The periphery has 1.75-2.00 Ph. more adaptation than the fovea.

The acuity of vision tests the central adaptation; the author uses specially constructed illuminated charts. The eyes are tied up from five to ten minutes, the vision taken and the strongest photometric lens through which the largest letters are recognized is determined. The illumination can be considerably reduced before the acuity of vision begins to diminish, so that the charted curve shows at first a plateau and then a gradual decline. The light difference sense diminishes in the same manner as the visual acuity. For testing of the light difference an illuminated chart with gray letters is used and it is observed how many letters the patient can read through the various photometric lenses.

The practical application of these studies is in the method which the author and C. Edmund have worked out for the examination of hemeralopia cases; these are tested for the light minimum of visual perception, the light difference perception, and visual acuity and fields under reduced illumination.

Ray K. Daily.

Raubitschek, E. **The present state of arrow skiascopy.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 221-242.

This amplifies in highly technical detail the author's previous article, Klini-

sche Monatsblätter für Augenheilkunde, v. 81, p. 162. For a full understanding, the reader must be referred to the original. (9 ill.)

C. Zimmermann.

Zenker, C. **Comparative study of the practical use of the modern refractometer.** Arch. f. Augenh., 1929, v. 100-101, July, p. 733.

Zenker used the Henker parallax refractometer, Kuhls's prism refractometer, and Thorner's refractometer. In myopia, these instruments agreed to within 0.25 diopter in eighty-six per cent of the cases. In myopic astigmatism, they agreed within 0.25 diopter in fifty-one per cent and within 0.5 diopter in another thirty-three per cent of the cases. In hyperopia there was more variation. In eighty-six per cent of the cases of simple hyperopia, there was a variation of 0.5 diopter, and in the remainder a variation of 0.75 diopter. In hyperopic astigmatism, in seventy-five per cent there was a variation up to 0.75 diopter and in twenty-five per cent a variation of from 0.75 to 1.25 diopters. The instruments were also found valuable in aphakia.

Zenker feels these instruments are valuable as an aid providing they are not combined with "mechanical thinking".

Frederick C. Cordes.

4. OCULAR MOVEMENTS

Cords, Richard. **Nystagmus and traumatism of the skull.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 180-194. (1 ill.)

Trauma of the skull may involve nystagmus in various ways, a classification of which is presented by the author with clinical histories. The centers which may be affected are the labyrinth, the frontal part of the brain and the fine structures of the cerebral stem. While lesions of the two former mostly create a transient nystagmus, damage to the cerebral stem may cause a permanent nystagmus, which may impair the earning power in severe cases.

C. Zimmermann.

Corkill, D. E., and Lythgoe, R. J. **Some experiments on eye movements.** Brit. Jour. Ophth., 1929, v. 13, Sept., p. 443.

The experiments were devised with a view to finding the time taken, under different conditions, for a subject to move his eyes from the position in which he was fixating a point to another in which he could see a rest-object, certain details of which he had to read. The experimenters devised a screen with a central fixation point, and four windows; above, below, right and to the left. In these windows was a time exposure letter C which was made to assume four different positions. The influence of glare was provided for by means of a light placed near fixation. Six subjects were used upon whom many tests were made. The results of these tests are tabulated.

The observers measured the time taken for a subject to move his eyes away from a fixation point and recognize a test-object momentarily exhibited at an angle of twenty degrees with the fixation point. Six subjects did the experiments, two of whom were rather insensitive to changed conditions, whilst the other four reacted as follows: small variations in the length of exposure of the test-object have a marked effect on the number of mistakes made; the ease with which eye movements in different directions can be made is in order: right and left: down: up. A glaring source of light in the field of vision has no appreciable effect on the number of mistakes except when it lies on a straight line between the fixation point and test-objects. This effect is attributed to after-images.

D. F. Harbridge.

Jaroslavsky, E. I., Zimmermann, G. S., and Spector, S. A. **On monocular nystagmus.** Archiv Oftalmologii (Russian), 1929, v. 6, pt. 1, pp. 33-43.

A complete ophthalmologic, otologic, and neurologic study of four cases of monocular nystagmus is reported, and the following conclusions are brought out. The same impulses which cause bilateral nystagmus are responsible for

its monocular occurrence, provided there is either a unilateral lesion of the oculomotor apparatus or some central impairment of coordination in the motor functions of both eyes. The latter disturbance of coordination is usually the result of a central nervous lesion or of some visual defect. Monocular nystagmus in children causes diplopia, while adults learn to suppress images in the oscillating eye. A normal visual acuity is at times observed in the nystagmic eye. *M. Beigelman.*

Lauber, H. **The treatment of strabismus in preschool and school child.** Wien. klin. Woch., 1929, v. 42, April 25, p. 591.

For children with strabismus, the earlier the correction can be made the better. He is most emphatic that glioma and other pathological conditions be ruled out. He recommends that glasses be used early and the different exercises and stereoscopic instruments as aids. Operative treatment is indicated as a rule after fourteen years of age. *Beulah Cushman.*

Moncreiff, W. F. **Disturbances of visual functions in concomitant squint.** Arch. of Ophth., 1929, v. 2, Aug., pp. 179-197.

In convergent squint secondary to the deviation itself there are three principal disturbances of function: 1, deficiency of the fusion faculty; 2, amblyopia ex anopsia; 3, retinal incongruity or abnormal correspondence.

Eliminating organic lesions of the deviating eye, deficiency of the fusion faculty is by far the most important etiological cause of deviation, though some cases may be due to abducens palsy.

Amblyopia ex anopsia is a frequent finding in these cases. Evidence shows that it may be acquired, though this fact has been denied by well known authorities. But the evidence derived from patients in whom amblyopia has developed or disappeared under observation seems irrefutable. In convergent squint, the image on the retina of the deviating eye must lie outside the macula, thereby producing diplopia unless one image is suppressed or a new, abnormal correspondence between the retinas is acquired. Such suppression, at first voluntary, later subconscious, eventually leads to amblyopia ex anopsia.

Retinal incongruity, or abnormal correspondence, the third of these secondary disorders, is an upset of the normal sensory relations of the two retinas, giving rise to disturbances of relative localization. There are two types: 1, the harmonious type, with equal values of the angle of squint and the angle of anomaly; 2, the unharmonious type, in which the angle of squint and of anomaly are unequal. In contrast with these are other cases retaining normal correspondence. In this latter type, the false image is homonymous with the crossing eye. In the harmonious type of abnormal correspondence, a false macula has formed, having the same visual direction as the fixing eye, and therefore an absence of diplopia. In the unharmonious type the squint angle has diminished, resulting in projection of the false image into the temporal field of the fixing eye.

Methods of measuring the squint angle in these two types are described in detail.

The importance of the sensory relations of the two retinas is great, from the standpoint of prognosis and therapy. Braun has classified all cases from this point of view in three groups, those with constant normal correspondence, those having at times normal and at other times abnormal correspondence, and those with fixed or constant abnormal correspondence. Full binocular vision with depth perception is usually possible in the first type, occasionally in the second, and never in the third.

Considering further the possibilities of therapy, the inception of fusion training with the Worth amblyoscope is of the greatest importance, as after six years of age the possibility of good results is greatly lessened and the time required greatly increased. If fixed abnormal correspondence is present, fu-

sion training will only result in diplopia. It should be noted that marked amblyopia must first be corrected before any results at fusion training can be undertaken. Accommodative convergence excess must be corrected and in some cases bifocals should be worn to reduce accommodative effort for near. Strong prisms to assist fusion may be used, gradually reducing their strength as fusion increases.

In conclusion, the writer emphasizes the importance of adding to our usual study of such cases examination of the relative localization or sensor relations of the two eyes. He also concludes that "abnormal correspondence is not congenital but acquired, and seems to be an effort toward adaptation of the sensoric relations to the squinting position". He calls attention to the fact that training with the amblyoscope is generally useless in the presence of abnormal correspondence, and that in all cases before operation the angle of anomaly should be taken into account to avoid paradoxical diplopia.

M. H. Post.

Mussa-Beili, U. C. **A case of abducens paralysis after grippe.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 361.

One case is described. A brief review of the literature reveals that the occurrence is not uncommon and that the lesion usually heals in one to eight weeks.

F. H. Haessler.

Prangen, A. de H. **A study of the comparative anatomy of the extraocular muscles.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 353.

The changes that take place in the extraocular muscles following the various surgical procedures commonly carried out on them can only be known by studying the after effects of a series of operations on animals. Hence the necessity of becoming familiar with the comparative anatomy of the extraocular muscles of the common laboratory animals.

The rabbit, cat, pig, dog and monkey were selected for experimental work because of their availability, size and relative ease in handling. A description of a thorough dissection of the extraocular muscles of the above-mentioned animals is accompanied by illustrations.

An outstanding feature was a retractor muscle found in the rabbit, cat, pig, and dog. In the monkey, although this muscle was absent, there was found a circular band of fibers which is perhaps a rudimentary retractor muscle.

The situation and relationship of the oblique muscles were greatly clarified. In the search for suitable animals for experimental, surgical research on the extraocular muscles, it was found that the dog was most desirable. It is an animal easily obtained and handled, and highly resistant to trauma and infection. Its orbits are accessible, and the extraocular muscles, large and welldeveloped, are approachable. *E. G. Lear.*

Sattler, C. H. **Apparatus for subjective and objective measurement of the angle of deviation of the eye, the graphic registration of the field of fixation, and field taking by the method of Bjerrum.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 345.

In 1927 the author described a piece of apparatus for graphic registration of disturbances of motility of the eye. It consists essentially of a dull black curtain with a system of coordinates ruled with green, on which one notes points of fixation of each eye by having the patient look through glasses with one red and one green lens, at a stationary red and a movable green object. In the objective measurement of the angle of deviation of the one eye, one hangs a small lamp in this center of the screen. The observer sits under the lamp and asks the patient to follow a small movable object with his fixing eye. The angle of deviation is measured by that point in the coordinate system at which the object is fixed when the deviating eye seems to fix on the lamp. The apparatus has an advantage over the Maddox tangent scale in that it also measures vertical deviation.

In the subjective measurement a red glass is placed on one eye and the patient is asked to point to the apparent

location of the double image. The use of the curtain as a Bjerrum screen is obvious.

F. H. Haessler.

Velhagen, K., Jr. **"Schauanfälle" (fixation spasms) and sleep.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 169-180. (1 ill.)

In a number of cases of encephalitis lethargica disturbances of consciousness occurred leading to deep cataleptic sleep. They showed a distinct dependence on the ocular muscles in being elicited by certain nerve impulses leading to fixation and closure of the eyes. Convergence spasms upward were very frequent, but it could be shown that convergence itself or accommodation are not the evoking factors. Hyperventilation may produce the same phenomena. These give a new insight into the essence of physiological and hypnotic sleep, indicating an important rôle of the ocular muscles and the different stimuli derived from them. Spasms of convergence may be a sign of a serious organic disease of the central nervous system, usually encephalitis. Fixation spasms ("crises oculogyres" in the French literature), and disturbance of consciousness thus are of great diagnostic importance.

C. Zimmermann.

5. CONJUNCTIVA

Columbi, G. **On the diffusion of trachomatous conjunctivitis in the province and in the city of Modena.** Ann. di Ottal., 1929, v. 57, March, p. 236.

The statistics presented have not been tabulated before. They represent thirty-three years of uninterrupted labor and are taken from 57,000 patients that have come under his observation. Of this number 9.97 per cent came under the designation of granulated eyelids. As to the social condition of those afflicted, the great majority were impoverished, poorly housed and living under bad hygienic conditions, in frequent contact with other trachomatous people at work, in the school, and elsewhere. What most contributed to diffusion of the malady was their ignorance of its nature, of its ready transmissibility, the media of infection, the opportunities for its cure, etc. Oculists have all noted that once trachoma enters the home of a workingman, the entire family soon becomes infected. Of 5,688 cases less than 2 per cent were found among other than the very poor. Lymphatic children were peculiarly susceptible, 1,101 or 10.61 per cent being under ten years of age. Complications requiring operation were frequent.

While the mountaineers were equally poor the percentage of infections was less than on the plains. The highest proportion was found on the low lands of Finale Emilia, reaching 19.10 per cent. During recent years active measures have been taken to control this menace to the people's welfare through education, segregation of the infected, opportunities for treatment, etc., and the number of cases has been constantly reduced in consequence.

Park Lewis.

Doggar, J. H. **Gonococcal conjunctivitis in a socket.**. Brit. Jour. Opth., 1929, v. 13, August, p. 406.

The patient, a female aged forty years, was suffering from an acute vaginal neisserian infection. The remaining eye was microphthalmic, and had a coarse lateral nystagmus and a coloboma of the chloroid.

D. F. Harbridge.

Junius, P. **Tuberculoma of the bulbar conjunctiva.** Arch. f. Augenh., 1929, v. 100-101, July, p. 170.

Junius reports the rather unusual condition of multiple tuberculoma of the bulbar conjunctiva. The process recurred several times, and each time the healing took place very slowly. In the last attack, ultraviolet light therapy was used with marked results, the condition healing quickly. The article also contains an excellent discussion of the condition.

Frederick C. Cordes.

Triossi, S. **Trachoma and secondary radiations: anatomic-pathologic modifications.** Saggi di Oftalmologia, 1928, v. 4, p. 224.

The effect of secondary x-rays in the treatment of eleven cases of trachoma was studied by means of biopsy before and after the exposure and iontophoresis treatment. The cases included the following types of the disease; one case of papillary trachoma; three cases of mixed trachoma; two cases of old mixed trachoma with gelatinization; one case of heavy gelatinous trachoma and three cases of gelatinous trachoma with fibrous degeneration. All of the cases showed marked or heavy pannus, in one case degenerative.

The irradiations were administered to the palpebral conjunctiva with the lids held everted by strips of adhesive plaster. The still everted lid received an application of galvanic current from three to four ma. for fifteen minutes, citrate of copper solution 0.25 per cent being the electrolyte. The combined treatments were generally made at two-week intervals, a few after three weeks, and occasionally after one month.

Microscopical biopsy was performed several months to one year after the end of the described therapy. The changes found included reconstruction of epithelial layers in regular strata formation, destruction of infiltrative elements, formation of new blood vessels and a marked proliferation of the connective tissue. Clinically, the author observed a particularly favorable reaction on the corneal pannus. The clinical aspect corresponds to the histological picture except in the few cases of apparent complete recovery in which there remained zones of subepithelial infiltration. The author states that the various methods of employment of this treatment of trachoma having demonstrated no individual optimal result, a more exact formula of technique is still to be sought. *F. M. Crage.*

Vogelsang, K. **Conjunctivitis.** Med. Klin., 1929, v. 25, May 10, p. 752.

The author gives a very comprehensive review of the treatment of different types of acute and chronic conjunctivitis. *Beulah Cushman.*

6. CORNEA AND SCLERA

Aubineau, E. **Corneal edema with hypercholesteremia.** Ann. d'Ocul., 1929, Aug., v. 166, pp. 645-650.

Five new cases are described. The vision is worse in the morning than in the evening. The cornea show an edema of the central parenchyma which changes during the day to islets of sloughing epithelium. These areas take a minor stain with fluorescine making it appear that the affected area is not the surface layer. An undue amount of cholesterin was present in the blood of each patient and a suitable diet relieved the trouble. *Lawrence Post.*

Avizonis, P. **Corneal hematoma.** Archiv Oftalmologii (Russian), 1929, v. 6, pt. 1, pp. 1-3.

An intracorneal hematoma situated between the epithelial layer and Bowman's capsule was observed thirteen days after a combined cataract extraction. Three weeks later traces of blood could still be discovered in the cornea. The following factors, in the author's opinion, contributed to the formation of the hematoma: a collapse of the cornea, which had taken place during the operation; the patient's general hypertension; and a temporary increase of pressure in the jugular veins transmitted to the pericorneal vascular system. Ten other cases of corneal hematoma reported in the literature are mentioned. *M. Beigelman.*

Barletta, V. **On the process of cicatrization in aseptic wounds of the cornea in relation to the reticulo-endothelial system.** Ann. di Attal., 1929, v. 57, March, p. 256.

The purpose of these experiments on dogs was to gain additional knowledge concerning the part played by the reticulo-endothelial system in the physiological healing of wounds in the cornea. In deep corneal injuries the reparative process presents two phases, one epithelial and one of the connective tissue.

The normal fixed cells of the cornea are unable to take on the acid stain if introduced intravenously even when their activity is increased by the cicatricial process going on in the corneal structure. The infiltration of aqueous in the wound carries with it fibrous filaments. These are true products of the ciliary endothelial reticulum secreting the aqueous, and take an active part in the reparative process. *Park Lewis.*

Butler, T. Harrison. **A case of blue degeneration of the cornea.** Brit. Jour. Ophth., 1929. v. 13, August, p. 401.

A male, aged fifty-five years, was treated with zinc sulphate for chronic conjunctivitis. Later he developed a superficial marginal ulcer for which flavine was used. About eight months later there was a recurrence of the ulcer. The conjunctivitis recurred, three years later, at which time there was noted a blue coloration in the lower portion of the left cornea. With the slit-lamp the cornea had a quilted appearance. The corneal tissue showed a coarse granulation thickly dotted with bright blue flecks. At first the color became more vivid, but about eight months later the quilting had disappeared and the color had faded to an ash grey. The fact that in certain lights there is a tendency to polychromatism, and that the blue is not seen by transmitted light, makes it almost certain that the color is an interference phenomenon, and that it is not due to actual pigmentation. (One illustration.) *D. F. Harbridge.*

Cremer, M. **Calcium therapy in phlyctenular keratoconjunctivitis.** Arch. f. Augenh., 1929, v. 100-101, July, p. 729.

Cremer observed 150 cases of phlyctenular keratitis. Half of this series were put on a calcium preparation, otherwise the treatment was identical for all. He used an absorbable calcium preparation (Calcium-Sandoz) that was tasteless and could be given to children over a long period of time. The results were sufficiently favorable to warrant further investigation of this therapy in phlyctenular keratoconjunctivitis.

Frederick C. Cordes.

Fazakas, A. **A new method of Denig's transplantation of buccal mucosa for the treatment of pannus.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 357.

In the original method buccal mucosa was implanted on to the area of sclera denuded by peritomy, and was held in place by sutures. The sutures are difficult to place and sometimes they cut through. At times the transplant slips away and is lost, or heals to ulcerated areas of the cornea. To avoid these difficulties the author performs a peritomy in such a manner as to leave intact three bridges of conjunctival tissue under which the transplant can be laid. It remains in place without suture, and when healing has begun the bridges which have now served their function can be severed, thereby completing the peritomy.

F. H. Haessler.

Goar, E. L. **Congenital pigmentation of the cornea (Krukenberg type).** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 346.

In 1899 Krukenberg reported a case of pigmentation of the cornea under the title of "bilateral congenital melanosis of the cornea". The arrangement of the pigment deposits was peculiar in that the granules were collected in a fusiform or spindle-shaped fashion in the deepest layers of the cornea. Later cases have often been alluded to as "Krukenberg's spindle".

The author has often observed isolated granules of pigment in the deepest layers of the cornea in healthy eyes. He describes a case in which the long axes of the spindles were in the vertical meridians of the cornea, directly in front of the pupils, but slightly nasal to the center of each eye. Slit-lamp examination revealed that the spindles consisted of closely packed dots or granules of chocolate-brown color lying in Descemet's membrane or on the endothelial cells of the cornea. No granules could be found in the plane anterior to Descemet's membrane, nor could he detect that the granules consisted of closely set rings with clear centers. Viewed in the axis of specular

reflection, the pigmented dots seemed to be in and between the endothelial cells.

The puzzling features about this condition are the grouping of the pigment granules into vertical spindles and the fact that it occurs usually in myopes.

No explanation for the morphology of the vertical spindles has been offered. It seems possible that, as the mesenchyme grows inward between the surface epithelium and lens saccule to form the primitive cornea and anlage of the iris stroma, it might fuse above and below leaving at some stage a vertical slit (the future pupil) closed by a thin connective-tissue membrane, containing cells which, according to Stock's theory, possess the power of pigment formation.

If for some obscure reason pigment granules should appear in the anterior chamber in early fetal life they might well be deposited on that part of the anterior chamber where the temperature is lowest—the center of the posterior surface of the cornea. As the endothelial cells form the membrane, the pigment granules may well take part in the process.

E. G. Lear.

Gutzeit, R. **Familial nodular corneal opacity.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 349.

This affliction was observed in members of four generations of one family. The lesion was first described by Groenouw in 1890, and in 1917 in his discussion of the literature in the Graefe-Saemisch Handbuch this author mentions fifty-four essays on the subject. The lesion is essentially a thickening of the endings of the corneal nerves in the form of amorphous, colloidal, or hyalin masses under the epithelium in the superficial stromal layer.

F. H. Haessler.

Jaensch, P. A. **Keratoconus.** Med. Klin. 1929, v. 25, May 31, p. 862.

The author reviews the history and medical treatment of keratoconus, including the use of the contact glass. He summarizes the late surgical treatment under four groups:

(1) Those operations dealing with excision of the bulging area of the cornea, as of a staphyloma, with or without a conjunctival flap.
(2) Pressure-reducing and fistula operations, as sclerectomy, Eliot's trephining, and sclerotomy.
(3) Optical iridectomy after previous scarring of the cornea by operation and tattooing.
(4) Extraction of the clear or slightly clouded lens and needling of the secondary cataract to aid in correcting the intraocular pathology.

Beulah Cushman.

Koyanagi, Y. **Primary tuberculous corneal ulcer.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 270-278. (3 ill.)

Two cases are described in detail with the histology. Repeated inoculations of pieces of the ulcer into the eyes of rabbits were negative. Also the treatment with bacillary emulsion had no noticeable effect. But the inflammatory focus showed a number of giant cells of the Langhans type and the accumulations of epitheloid cells in the surrounding episcleral tissue, surrounded by round cells, rendered probable the diagnosis of a primary tuberculous ulcer. The clinical picture with progressive disintegration of tissue was entirely different from the common form of phlyctenular keratitis.

The second case, a youth aged seventeen years, presented a corneal ulcer with tuberculides of the skin.

C. Zimmermann.

Meerhoff, W., Meerhoff, A., and Montes Pareja, J. **Keratoconus of endocrine origin corrected by glandular therapy.** Arch. de Oft. de Buenos Aires, 1929, vol. 4, Mar., p. 129.

The authors trace the origin and growth of the dystrophic cause of keratoconus, beginning with the views of Siegrist in 1912. In the seven cases thus far studied, disturbances of this kind have been demonstrated. Recently

another in its developmental stages fell into their hands. This is reported in detail, including an unusually happy outcome as to general health and visual power. The fact that these cases have been inexorably progressive has been one of their distinguishing features.

The patient was a fourteen year old boy, who had developed normally up to his eighth year. Then it was noted he began to hold his books too close, and gradually to accumulate fat. Lenses for his myopia were given and changed frequently, but his visual acuity had gradually decreased to a point where he could no longer read.

There were no similar conditions elsewhere in the family. When first seen vision in the right eye was reduced to one tenth, in the left to one fifteenth.

The slit-lamp did not show any alteration in the corneal nerves. There was no Fleischer ring, but a distinct thinning was visible in the central portions of the corneas.

Physically the boy was an adipose monstrosity, weighing sixty-six kilos with absolutely no development of the external genitals. Fat hung in great folds on the breasts, the glutei. the hips and the suprapubic region. There was no hair on the face, axillæ or pubes. The sella was small, its tuberculum enlarged and prutuberant, the anterior clinoid processes short, while the posterior were large and directed so abnormally forward as to almost enclose the sella entirely.

The boy laughed or cried with equal facility, was timorous and liable to outbursts of either anger or joy without justification for either. He presented the picture of typical dystrophia adiposogenitalis of Fröhlich. with a puerile mentality. Serologically the patient was negative. The details of the treatment are not given beyond noting that it involved multiglandular therapy.

The improvement in appearance as shown by photographs is striking. Coincidentally there was a definite change for the better in his mentality which rapidly approached normal. The vision increased steadily not only subjectively but by retinoscopic findings, and the cornea receded to its normal contour. No local treatment of any kind was attempted. With correcting lenses he read easily, his voice assumed a deeper tone, and "his intelligence awakened to that of a youth of his age".

A. G. Wilde.

Moscardi, P. **Ultraviolet therapy in keratitis.** Saggi di Oftalmologia, 1928, v. 4, p. 298.

The good results obtained by many workers through the use of ultraviolet therapy in keratitis are mentioned by the author. Of the corneal conditions treated by them ulcus serpens has been benefitted most. The fact that some results were diametrically opposite stimulated the author to perform the experiments which he herein reports.

The cases treated and observed numbered thirty. They consisted of twenty-three cases of keratitis with hypopyon, three of severe, obstinate corneal ulcers, and four of chronic non-suppurative keratitis. All the kerato-hypopyon cases had corneal ulceration of widely varying intensity.

Treatments were administered with the Koeppe lamp. The corneæ were exposed twice daily for from four to seven minutes for fourteen to sixteen days. The light was devoid of the greater part of its thermic element.

Out of the ten severe cases of hypopyon-keratitis, seven showed a good healing process, the other three eyes being lost. In the other cases definite cures resulted with a good return of vision. This was also true of the three cases of severe persistent corneal ulceration and the four cases of chronic non-suppurative keratitis.

The excellent results obtained in suppurative keratitis, especially ulcus serpens, prompts the author to recommend the administration of this form of treatment which is easily carried out and is devoid of pain and not injurious to the sound corneal tissue, lens or deeper parts. Its use is recommended also in the light non-suppurative cases and all corneal affections resisting local treatment. (Bibliography).

F. M. Crage.

Panico, Emanuele. **Contribution on the study of experimental tuberculosis of the cornea.** Ann. di Ottal., 1929, v. 57, April-May, p. 314.

These experiments were made on rabbits. Bacilli were introduced with scarification of the cornea, inoculation in the cornea at the periphery and in some instances in the anterior chamber. The usual reactions were observed. The purpose of the author was to determine whether ocular membranes would be invaded and the course that the infection would run.

The corneal inoculation whether of living bacilli or bacilli killed by heat invariably resulted in the formation of a nodule especially involving the corneal parenchyma. The tuberculous node at the end of a month began to lose its rosy color and starting in the central part took on a greyish white, the beginning of a caseous degeneration, to be followed by the sloughing out of the mass leaving an ulcerated surface behind.

The author concludes that primary tuberculosis of the cornea follows a benign course and heals after a period of about three months. Only the conjunctiva and iris participate in the inflammatory process and in these spontaneous recovery follows. No other tissues became infected. Giant cells were never met in the corneal tissue. Koch bacilli were always present but limited to the inoculated area. The changes in the cornea, conjunctiva and iris must be attributed to the tuberculous toxin.

Park Lewis.

Samuels, Bernard. **Detachment of Descemet's membrane.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 427.

Although folds, ruptures, and tears in Descemet's membrane are not infrequently referred to in the literature, mention of detachments is seldom found. However within recent years in routine slit-lamp examinations, note has been more frequently made in the clinical charts of detachments. Three cases are described, and the following classification of detachments of Descemet's membrane is proposed:

(a) Active (pushed back). Under this head come separations brought about by active exudation between the lamellæ and the membrane. (b) Passive detachments (pulled back or torn away). This was very common. Whenever there is a heavy exudate in the anterior chamber, which undergoes organization and contraction, it may draw Descemet's membrane away, leaving the lamellæ behind. (c) Detachments due to difference in elasticity between the parenchyma and the membrane. It is supposed that Descemet's membrane is not as extensile as the lamella.

The tendency of the membrane to roll on itself or to form folds when released from the cornea is attributed to a lack of elasticity. Whenever a detachment takes place as a result of contraction or distention of the stroma, serum first fills out the spaces, later come cells, and still later fibroblasts and scar tissue, as in the passive form of detachment.

From the standpoint of the surgeon no great importance can be ascribed to all the various forms of detachments. They occur mostly in complicated operations, or where repeated operations have been made. They have no effect on the healing of incisions or on the tension of the eye, and often none on the transparency of the cornea.

E. G. Lear.

Sommer, Ignatz. **Histological findings in an eye with deep keratitis.** Zeit. f. Augenh., 1929, v. 68, July, p. 260.

The eye was enucleated from a man aged forty-five years because of pain. It had been affected for over ten years. The epithelium was stippled, and in the superficial and moderately deep stromal layers was a disciform, slightly eccentric diffuse opacity with radial stripes. Vision was reduced to light perception. Histologically the important changes were found in the cornea, while diffuse and circumscribed lymphocytic infiltrates in episclera, chamber angle, iris, and choroid were considered secondary. The severest changes involved the corneal center. The epithelium was papillated, and under it was a pannus

with scar tissue. Bowman's membrane traversed the scars, was perforated at its center, and one of the free edges was rolled inward. The superficial stromal layers were replaced by scar tissue, beneath which were peripherally located lymphocytic infiltrates. Here and there the stroma cells had proliferated and there was also necrosis and degeneration of these cells.

The deep layers of the stroma were occupied by a disciform infiltrate consisting of lymphocytes, and epithelioid and giant cells. The infiltrate had perforated Descemet's membrane. These findings differ in no fundamental respect from Igersheimer's description of luetic parenchymatous keratitis. Hippel and Hess have both stated that luetic and tuberculous parenchymatous keratitis can not be distinguished in the clinical picture. Only greyish yellow infiltrates in the deep corneal layers near the limbus point to tuberculosis.

In this case the author feels justified in believing the disease to be tuberculosis, because it started at a time of life when luetic keratitis does not usually begin, it remained unilateral for seven years, and the patient had apical tuberculosis and reacted to tuberculin. Histologically only part of the cornea was involved, and it has been found by Wolff that it is characteristic for tuberculosis to involve only circumscribed areas of the cornea while luetic keratitis involves the entire structure diffusely. *F. H. Haessler.*

Tyson, H. H. **Tuberculoma of the cornea.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 72.

This condition is rather rare, occurring as an ivory colored tumor beginning at the limbic portion of the cornea. The edge, usually crescentic, showed no ulceration, and might assume the entire thickness of the cornea. It was usually chronic and progressive in growth, and did not, apparently, produce any increase in tension. It might occur without any definite finding of tuberculosis elsewhere, and was very resistant to treatment.

He cited several cases which he had treated with tuberculin injections over long periods of time, in connection with a general hygienic and dietary régime. The results had been gratifying.

E. G. Lear.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Burnham, G. H. **Treatment of iridocyclitis with raised tension.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, p. 57.

The author stresses his "combined treatment" for the chronic iridocyclitis of sympathetic ophthalmia, gonorrheal iridocyclitis, and the early stage of nonspecific iridocyclitis accompanied by increase of tension. This treatment consists of hypodermic injections of pilocarpin $\frac{1}{12}$ grain and internally mercury and iodide and bromide of soda. The injections are given daily for ten days, after which there is a six weeks' rest. The series is then repeated. The internal medication is continued during the interval. If the glaucoma or the iridocyclitis takes on an acute form, but before the pain has become very severe, the author instils pilocarpin drops locally, combined with the internal medication. If however, the pain is great, the tension high, and the vision only light perception, operation is resorted to, but the "combined treatment" is also carried out. *M. E. Marcove.*

Greeves, R. A. **The cause and treatment of iridocyclitis with raised tension.** Trans. Ophth. Soc. United Kingdom, 1928, v. 148, p. 45.

The author discusses the causes and treatment of this condition as distinguished from secondary glaucoma arising from sequelæ of an inflammatory process, such as iris bombé. He classifies secondary glaucoma into three varieties: (1) long standing cases in which the spaces of Fontana are blocked either by condensation of the fibers of the pectinate ligament or invasion of the spaces by new granulation tissue from the root of the iris; (2) more recent cases in which the spaces of Fontana are blocked by large cells with swollen cell bodies each containing

a small nucleus; (3) cases in which the angle and spaces of Fontana are open, as well as the canal of Schlemm.

He comes to the conclusion that these cases are due to alteration in the composition of the intraocular fluid. On inflammation of the ciliary body, the relative composition of the aqueous and blood is altered, with the result that the colloid constituent of the anterior chamber is increased, and this leads to imbibition of fluid into the anterior chamber by osmosis. While the normal excretory mechanism is undoubtedly elastic enough to take care of this increase in fluid content, partial blocking of the angle with cells or by senile changes might be enough to interfere with the drainage.

In regard to treatment, the author quotes authorities who use mydriatics exclusively and others miotics with apparently the same results. He summarizes his own treatment as follows: With the anterior chamber shallow and the eye suggestive of predisposition to glaucoma, a miotic is used. With a normal or deep chamber, homatropin is used first, and if beneficial it is changed to atropin. If no relief is obtained with homatropin, miotics are resorted to. If with the latter a definite improvement follows and the tension remains normal for several days, a mydriatic is again used. The operation of choice is trephining, as it takes the longest to close up.

M. E. Marcove.

Iga, Fuminori. **Sensitization and sympathetic choroiditis from bacillus subtilis.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 195-213. (12 ill.)

With reference to the article by Marchesani on sympathetic ophthalmia in the light of experimental investigations (Arch. f. Augenh., 1929, v. 100-101, p. 603.) Iga undertook controlling experiments with bacillus subtilis in rabbits. These experiments are reported in detail. He concludes that the bacillus subtilis is by no means nonpathogenic for rabbits. After introduction into the eye, it produces severe panophthalmitis and under appropriate conditions also true bacterial metastases in the second, intact eye. The metastases occur through the blood stream no matter whether the infection takes place from the auricular vein, the eyeball or the empty orbit. The intensity of the focal inflammation is greatest after introduction of the bacillary emulsion into the blood. There are also changes of the intact eye after inoculation of the anophthalmous orbit, or after repeated intraocular infections. The hematogenic eye metastases produce an abortive septic endophthalmitis with disseminated foci in choroid, ciliary body, and iris in which the bacilli can be found. Foci in the stem and sheath of the optic nerve show that the metastases are not limited to the globe exclusively, and might also be found in some internal organs. Marchesani is wrong in interpreting the results of his experiments as a sympathetic choroiditis, and as the first confirmation by animal experiment of the anaphylactic theory of sympathetic ophthalmia. Neither the injury of the first eye, nor the admixture of bacillus subtilis or its toxins with disintegrating uveal tissue of the first infected eye, played a part in the production of inflammation of the second eye. The metastasis occurs independently, and also if the first eye has been removed and its anophthalmic orbit has been inoculated.

C. Zimmermann.

McMullen, W. H. **Iridocyclitis with raised tension.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, p. 51.

The author divides the cases into three types: (1) those acute cases of iridocyclitis with early increase of tension; (2) those cases which resemble acute or subacute primary glaucoma but in which careful examination reveals signs of uveal inflammation; (3) chronic cases in which increase of tension occurs months or years later.

Type one represents the usual acute iridocyclitis with normal or deep chamber, in which increase of tension follows the use of atropin and is attributable in some degree to its use. The changes are probably entirely due to the inflammation; if this subsides quickly the eye will return to normal. The essential

cause of the high tension in this type is the iridocyclitis and the most effective means available should be used for the relief of that inflammation. Slight rise of tension for a few days apparently does no harm, but if allowed to persist it causes permanent damage and it should be relieved. If there is considerable pain, steaminess of the cornea, and tension plus one, operation should not be delayed more than twenty-four hours. Since the tension is transient the operation of choice should be one that will lower the tension for a sufficiently long period and will leave the least permanent change in the eye. For this reason paracentesis is indicated, the wound being reopened at intervals if the tension does not go down. Purgation and diaphoresis are advised as they render the blood hypertonic and cause absorption of fluid from the eye.

In type two the history may be similar to that of an acute primary glaucoma, with signs and symptoms similar, but examination with the biomicroscope indicates the presence of inflammation of the uvea. The author thinks that the iridocyclitis is not the essential factor here but that the eye is predisposed to glaucoma by anatomical changes with a very small margin of safety. The tension is quickly relieved by miotics but goes up again. Permanent reduction is obtained only by operation, either iridectomy alone or iridectomy with filtration.

In type three the onset of glaucoma may be insidious or may be overlooked until cupping or field changes develop. Results are probably due to changes of lasting character produced by inflammation. Medical treatment is usually of no avail and operation has to be resorted to. Iridectomy may have a favorable effect on the iridocyclitis itself as well as on the glaucoma, and obviates the troublesome complication due to extension of posterior synechiæ. The operation of choice aims at the formation of a filtering scar.

The chief thing to consider in these cases is whether the rise of tension is due to temporary or permanent change. In the former the iridocyclitis should be treated with the ordinary means temporarily reducing tension if necessary. In the latter case operation without delay is called for, to produce permanent reduction in tension.

M. E. Marcove.

Mandicevski, V. **A peculiar form of calcium deposit in the eye.** Zeit. f. Augenh., 1929, v. 68, July, p. 221.

The author gives a minute description of histological preparations of an eyeball in which calcium deposits occurred in the form of thin plates and needles in the region of the anterior and posterior chambers. Such plates and needles were very numerous in each section. Microchemical tests demonstrated the fact that the calcium was combined with fatty acids. Sections from another eye with similar findings are briefly described. As the crystals were all deposited in the most dependent part of the eye it seems probable that they were formed free in the fluid.

F. H. Haessler.

Smith, J. A. **Sympathetic ophthalmia.** Arch. of Ophth., 1929, v. 2, Aug., pp. 169-173.

The writer states that when inflammation appears in the fellow of an injured eye months or years after an injury, provided the injured eye has been free from trouble in the meantime, the inflammation should commonly be regarded as an independent condition. Occasionally, nevertheless, related attacks do occur. In the case presented the diagnosis of sympathetic ophthalmia occurred forty-eight years after injury. The diagnosis was made from the history, the clinical course, and the microscopic findings in the enucleated eye and in the iris tissue from the sympathizing eye. Three fine plates are presented with the paper.

M. H. Post.

8. GLAUCOMA AND OCULAR TENSION

Krause, K. **Nævus flammeus and glaucoma.** Zeit. f. Augenh., 1929, v. 68, July, p. 244.

Two cases of glaucoma in patients

with nævus flammeus are reported. In the first one there was a typical glaucoma simplex which developed unilaterally during puberty on the side of the nævus. Teleangectasis changes were visible in the vessels of the conjunctiva, iris, and choroid. Stasis in the neck veins produced a slight rise in tension and a dilatation of the blood vessels of iris and choroid. Compression of the carotid on the affected side produced only a moderate decrease of ocular tension. In the second patient hydrophthalmos congenitus existed on the side where nævus was more extensive. It seems justifiable to assume that the hydrophthalmos resulted from congenital malformation of the uveal blood vessels. There also were tonic and clonic spasms of the extremities on the side of the normal eye, and enlargment of the liver, and these may have been produced by hemangioma of the brain and liver.

F. H. Haessler.

Lambert, R. K., and Wolff, Julius. **The systemic use of hypertonic solutions in glaucoma.** Arch. of Ophth., 1929, v. 2, Aug., pp. 199-203.

Numerous investigators have found that the systemic use of hypertonic solutions constantly reduced the intraocular pressure in animals. In twenty-five normal men the authors produced a fall of forty percent in intraocular tension after the intravenous injection of 15 gm. of sodium chloride, and a drop of twenty-one percent after one-half that amount. Two hundred to three hundred c.c. of a five percent solution was injected through a small needle by gravity. Dextrose is much less effective, weight for weight.

Nine cases are reported. The drop in tension varied from 7 to 17 mm. Hg. In normal cases the drop lasted rarely more than two hours; in glaucoma occasionally for as long as twenty-four hours. The procedure is recommended as a preliminary to operation.

M. H. Post.

Magitot, A. **Glaucoma and the pathological problem.** Ann. d'Ocul., 1929, Aug., v. 166, pp. 609-639.

This is the fourth and final installment on this subject. The conclusion of the author is that glaucoma is due to impaired permeability of the capillaries throughout the eye. When the posterior segment is especially affected an œdema of the vitreous and the type of glaucoma with shallow anterior chamber results; when the anterior segment is involved the type with deep anterior chamber is seen. Pilocarpin and eserine act, not by drawing the iris away from the angle of filtration, but by their influence on the cells of the capillary walls, increasing their permeability.

Glaucoma is a sick eye in a sick body and in treatment this fact must be recalled and careful investigation of the entire individual must be made with especial reference to angiosclerosis which is usually the underlying cause of the disease.

Lawrence Post.

Moscardi, P. **Therapy of glaucoma with adrenalin and glaucosan.** Saggi di Oftalmologia, 1928, v. 4, p. 122.

The author found that subconjunctival injections of adrenalin and instillations of left glaucosan produced a notable but temporary decrease in intraocular pressure, levoglaucosan being slightly the more efficient in the greater number of cases. When used with pilocarpin glaucosan causes a notable decrease in pressure which is maintained for a considerable period. Glaucosan used as instillations does not produce general disturbances on the circulatory system analogous to adrenalin. It can be used, therefore, in all cases and is to be preferred to adrenalin. Adrenalin and amin-glaucosan give very poor results in acute congestive glaucoma. The author feels that a longer period of observation is necessary for a more definite opinion on levoglaucosan. He considers the drug of some value as a hypotonizing substance surely deserving of greater merit than it has already been given. It should be employed in cases where pilocarpin is without effect. (Bibliography.)

F. M. Crage.

Parker, W. R. **Management of simple glaucoma.** Arch. of Ophth., 1929, v. 2, Aug., pp. 174-178.

Cases of chronic simple glaucoma may be grouped under four headings: 1, those in which spontaneous recovery takes place; 2, those in which arrest follows general treatment and local use of miotics; 3, those halted by surgical intervention; 4, those in which the condition progresses despite all forms of intervention.

The first type includes early cataract with lens swelling and low-grade uveitis.

Under the second heading the author considers especially those cases treated by epinephrin and with levoglaucosan. The first method resulted in no cases of permanent benefit. The same held true for levoglaucosan. Similar results obtained by Ellett are referred to, as are his good results with posterior adhesions in cases of acute iritis, results also shared by the author's patients.

In considering the third group, it appears that no one operative procedure is applicable to all cases. Iridectomy seems best in the presence of a moderately deep anterior chamber, when the fields are not markedly contracted, when the iris is not atrophic, and when variable tension persists following the use of miotics. In all other cases trephining is recommended.

The fourth group is emphasized by a recital of the numerous expedients employed in certain cases without result.

Considering operations in general, it appears that sixty percent of patients will have satisfactory results, thirty percent will receive no benefit, and ten percent will be made worse from operative interference. *M. H. Post.*

Tessier, Giulio. **Behavior of the iris and the endocular tension in the eye of the cat experimentally contused.** Ann. di Ottal., 1929, v. 57, April-May, p. 299.

A plummet of lead was suspended by a pulley and allowed to strike upon the center of the cornea in a series of cats. The head of the cat was placed against a block of wood and the lead which was of a weight of 200 grams and with the surface smooth was allowed to swing from measured distances varying from 10 cm. to 50 cm. from the cornea. Beyond this point the injury to the cornea was so serious as to make the eye useless for this experiment.

Paralysis of the iris was an occasional result only, myosis was predominant and of short duration depending on the extent of the injury. The tension was almost always increased but without reaching as high a degree as when injury was inflicted on dogs or rabbits.

Repeated contusions, no matter to what extent, gave rise to long continued hypotension. A weak constant current had no appreciable effect on the trauma. The varied effect produced on animals of different species led the author to conclude that exact deductions could not be drawn either as the action of a contusion on the iris or on the tension.

In the great majority of these experiments the contused eye showed hypertension in a degree proportionate to the injury but never reaching more than 40 mm. of mercury. Hypotension was exceptional. It remained longer than the hypertension and was of a lesser degree. *Park Lewis.*

9. CRYSTALLINE LENS

Byers, W., Gordon, M. **Slit-lamp study of an unusual case of congenital cataract.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 100.

The findings in the left eye were unlike anything the author had been able to find in literature. An opacity in the left lens presented a very bizarre picture. An elongated cone extended from the margin of the dilated pupil, at six o'clock, to the middle of the lens. Here it seemed to pass through a round absolutely black hole to the center of the lens, where it broke up into a number of glistening, granular tufts that ran in various directions. The main opacity was not smooth but wavy and uneven as on the right side. The rest of the lens appeared to be quite clear. The clear area beyond the two components of the embryonic nucleus was not open as is usually depicted, but was appar-

ently closed inward by a zone of denser lenticular fibers.

E. G. Lear.

Conway, J. A., and Thomson, J. M. **A rare form of developmental cataract.** Brit. Jour. Ophth., 1929, v. 13, Aug., p. 402.

This is the history of a man aged sixty-three years who was struck in the right eye by particles of debris. Eighteen months later he claimed deficient vision for purpose of compensation. At the three o'clock position the iris bulged forward presenting a grey area while a point appearing as a synechia ended in a lens opacity. After dilatation of the pupil, the slit-lamp showed no sign of a previous corneal wound. A narrow band of whitish tissue like a knotted cord was seen traversing the anterior chamber in an antero-posterior direction. The anterior end was attached to the collarette of the iris at three o'clock, whence it dipped over the pupil margin and pierced the anterior lens capsule, running straight back through clear lens to end in a flattened white opacity lying in the equatorial plane of the lens. As far as could be judged this opacity lay at the junction of the fetal and infantile nuclei. The lens opacity, in the author's opinion, was not due to trauma but to natural causes, or more properly speaking to an aberration in the normal sequence of the steps of the development of the eye.

D. F. Harbridge.

Magnasco, M. **Black cataract.** Saggi di Oftalmologia, 1928, v. 4, p. 63.

The condition is usually present in very old individuals and though one observer reported an incidence of 4 in 1,000 cases of cataract, the proportion is generally held to be much lower.

In a typical case the pupillary space appears almost as black as in a normal eye. Observed under oblique illumination, the anterior lens capsule throws a grayish metallic reflex. These signs, together with the absence of punctate specks and striæ, distinguish this from all other forms of cataract. It usually develops in an eye which gives a negative history of previous ocular disease or trauma.

The cases wherein hematin and other pigments of blood origin were found in the lens material, were in eyes having had endocular disease or previously subjected to intraocular operations.

The case presented in this paper was typical objectively. General physical examination, the usual laboratory routine examinations and examinations of the cataract for pigments and fat were all negative. However, the cholesterin index, which was 2.98 gr. per 1,000 mils, showed an increase. Qualitative cholesterin tests on the lens substance were markedly positive.

The author concludes that black cataract represents an exaggerated densification of the crystalline fibers transforming the entire lens into nucleus. This densification and complete sclerosis devoid of spaces, droplets, vacuoles and other formations found in common senile cataracts, together with the dark nuclei of the anterior epithelium and granular makeup of the fibrous protoplasm, give to the cataract its dark color, probably by way of an exaggerated refractibility. He believes that individuals who have an increase in blood cholesterin and develop cataracts are predisposed to this type of lenticular sclerosis. (Bibliography.)

F. M. Crage.

O'Brien, C. D. **Biochemical studies of the blood in patients with senile cataracts.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 438.

In the series of cases reported here, the blood analyses include estimates of urea nitrogen, uric acid, creatinin, lecithin, fats, sugar, and sugar tolerance. Other determinations were also made of chlorids, calcium, inorganic phosphates, carbon-dioxide content and pH, but most of these were normal and not reported. Apparently there was a disturbance of metabolism in a great majority of these cases.

Uric acid showed rather high values in seventy-seven percent of the cases, perhaps indicating an early kidney dys-

function, although this might be expected in aged individuals. The blood fats (cholesterol, fat, and lecithin) showed abnormally high values in a majority of cases, and in view of the fact that the cataractous lens itself shows a great increase in cholesterol content, this appeared suggestive. However, further work should be done under perfectly controlled conditions.

One of the most suggestive findings was that of high fasting blood sugar —this was indicative of a disturbed carbohydrate metabolism, and when checked with the glucose tolerance test, proved that many of the cases could not properly utilize sugars. Since Ghanz found that the presence of sugar aided light in producing lens opacities, it may have been that these patients had no abnormally high sugar concentration in the aqueous.

If an abnormal sugar metabolism had anything to do with the production of cataract, the author wonders why diabetic children invariably do not show lens changes. The answer to this may be the comparatively short period of time during which children with diabetes lived before the advent of insulin; since insulin has been used the blood sugar has been kept within normal limits. Further investigations in this field are being carried out.

E. G. Lear.

Reese, W. S. **Posterior lenticonus.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 339.

The term "lenticonus" had been used to describe a protruberance of the anterior or posterior surface of the lens. The anterior type was apparently always conical, the posterior, however, might be either conical or globular.

Some cases of posterior lenticonus are erroneously named. The greater the opacity, the more one was inclined to doubt the authenticity of the case. The theories as to the production of lenticonus are based on hyaloid traction, rupture or thinning of the posterior capsule, enlargement of the lens, and displacement of the nucleus. None of these were present in the cases reported. The slit-lamp examination of the cases suggests a very plausible theory as to the production of posterior lenticonus and one that seems in accord with the observed facts. When the adult nucleus begins to form, some process on the posterior face of the embryonal nucleus, possibly of an inflammatory or irritant nature, causes a local increased growth of the posterior lens capsule, which at that time, is in direct apposition with the embryonal nucleus. A resulting bulging of the capsule posteriorly then occurs, thus encouraging and allowing relatively greater growth of the adult nucleus at that point. The rapidity with which this bulging occurs probably explains the deficiency in lens fibers as indicated by the spaces shown in the illustrations. These include the volcano-like space on the posterior face of the embryonal nucleus and vacuole-like spaces extending backward from this, forming a cone with its base in the lenticonus. The reason that these spaces are more numerous posteriorly is probably that the process begins at a period when the production of lens fibers in the adult nucleus has hardly had time to get under way. The increase in the size of the adult nucleus may also help by facilitating readjustment of the lens fibers.

E. G. Lear.

10. RETINA AND VITREOUS

Amsler, M. and Dubois, H. **Ophthalmoscopic topography and retinal detachment.** Schweiz. med. Woch., 1929, v. 59, June 22, p. 658.

The treatment of retinal detachment by the method of Gonin, who assigns to the retinal tear the principal pathogenic rôle, demands as a preliminary a most painstaking ophthalmoscopic examination. Not only must the tear be detected but it must be accurately localized if the perforating and obliterating thermocauterization is to be successful. The difficulties experienced in localization in the fundal periphery led the authors to devise a chart for topographic ophthalmoscopy which has greatly facilitated the work in their hands. It has two concentric circles, an outer one

of 165 mm. in diameter and an inner one of 125 mm. in diameter, twelve radii which stop at some distance from the center, and a 5 mm. circle in its appropriate place to represent the papilla. The outer circle corresponds to the extreme periphery of the fundus visible ophthalmoscopically, the inner one to the equator, and the twelve meridians to the hours on a clock dial. In explanation of the rather large dimensions of the chart, the authors point out that there is a prevalent misconception as to the actual size of the ophthalmoscopically visible fundus owing to the small area of the fundus pictured in most textbooks preoccupied with pathology around the posterior pole, that actually about thirty-three disc diameters across is visible, and that under the usual magnification of slightly over three times in indirect ophthalmoscopy the diameter of the disc is 5 mm. They urge, also that the extremely trying task of magnifying or reducing the dimensions of what one sees in the making of an ophthalmoscopic drawing is obviated by having a chart of a size to correspond to the apparent dimensions of the fundus as seen in indirect ophthalmoscopy. As a further aid in making the disc-diameter, which is the indispensible yardstick in fundus localization, more precise under the varying conditions of refraction of observed eyes and of the lens used in the ophthalmoscope, and for the purpose of obviating the necessity of returning to it to refresh one's memory as to its size and risk losing the often elusive retinal tear, the authors make use of Haab's pupillometer rule. The patient holds this against his temple and the apparent size of the disc is noted and the exact measurement used throughout that particular examination. The usual problem in spontaneous retinal detachment and the localization of its tears, whose seat of election is at the equator, is thus the determination of the number of disc-diameters between it and the limit of visible periphery, called for convenience the "ora," although it is not the true anatomical ora serrata. This arbitrary "ora" is placed by the authors at 8 mm. from the limbus. The determination of the meridian is facilitated considerably by the use of the plane mirror and the use of a special chart of the fundus reflex devised by Amsler some years ago.

M. Davidson.

Dick, A. M., and Sawhney, M. R. **Report on a case of so-called coloboma of the macula.** Brit. Jour. Ophth., 1929, v. 13, Sept., p. 445.

The outstanding features in this case report are the size of the coloboma, it being half the size of the disc, vertically oval instead of the usual oval, sharply defined, and contained round shining bodies which looked like cholesterin crystals, a degenerative product the result of an old hemorrhage, or inflammation. This favors the impression that the condition was pathological in origin. Two illustrations. *D. F. Harbridge.*

Junius, Paul. **Remarks on Coats's retinitis, Leber's retinal degeneration with multiple aneurisms, and the angiomatosis retinæ of Hippel.** Zeit. f. Augenh., 1929, v. 68, July, p. 207.

This is a general discussion of these three conditions with many citations from the literature. A striking fact is that all three occur chiefly in young males. These three diseases have many points of similarity in clinical course and result, and this may point to a similarly inherited or acquired defect. One may speculate to the effect that the defect involves the vasometer nerves, but much more observation is needed before any definite conclusion can be drawn. It is not impossible that Recklinghausen's neurofibromatosis and syringomyelia will be drawn into the discussion, and the views of Unna on congenital vascular nævi must be appraised. *F. H. Haessler*

Rieger, H., and Trauner, R. **A case of Biedl-Bordet syndrome, and the heredity of this condition.** Zeit. f. Augenh., 1929, v. 68, July, p. 235.

A child is described with adiposity, retinal degeneration and polydactylia. The retinopathy was not a typical

retinitis pigmentosa, but a granular form of tapetoretinal degeneration. The family tree of this daughter of normal but consanguineous parents, as well as a critical examination of previously reported observations, demonstrates that the individual symptoms are determined by associated hereditary factors. These facts show that in man the hereditary determinants for different embryonic layers and mutally different organs arising from these layers may reside in the same chromosome.

F. H. Haessler.

Kerry, Richard. **Retinal detachment.** Brit. Jour. Ophth., 1929, Sept., v. 13, p. 447.

This author reported in the May, 1928 issue of the same journal three cases in which restoration of vision occurred following the use of iodized oil. He now reports two cases which did not result so happily. In the first case, following a few weeks' treatment, the superior temporal vein which was shrunken assumed a normal appearance but there was no return of vision. The fundus in the second patient when first observed had a truncated cone appearance. Eight months later the retina was apparently in normal position above, and well below the horizontal on the nasal side. On the temporal side and below it remained unattached. The condition and vision varied. The observer is inclined to the belief that the subretinal fluid was, in part, derived from the vitreous. *D. F. Harbridge.*

Maggiore, L. **On the functional value in the visual act of the single segment which comprises the cones and rods.** Ann. di Ottal., 1929, v. 57, April-May, p. 289.

The cones and the rods are in substance extensions of the visual cells. They consist actually of three segments, an external, an intermediate and an internal. The foveal cones are longer and finer than the others in the macula or elsewhere in the retina. There is no luminous point in the fovea but even here are minute circles of diffusion. Considering the retina as absolutely transparent the image is not arrested before reaching the pigment layer. The cones and the rods have their bases resting against a smooth and continuous membrane, the membrana limitans. The cones and the rods being of differing lengths on their inner surface present an irregular surface unfitted to serve optically against the pigment as an opaque screen. It is only at their bases that these elements are at the same line forming a compact neural mosaic, and here alone do they meet the requirements of an optically receptive surface.

The author considers that the prevalent conception, that vision must have its origin, whether physical, chemical or biological, at the external uneven terminals of the external segments is an a priori hypothesis. The structure of the cones and the rods is of too complex a nature to warrant the acceptance of this view as a demonstrated fact and aside from the morphology involved the functional visual act should be more carefully studied. In the field of hypothesis the idea is worthy of consideration whether the external segment by reason of its proximity to the choriocapillaris may not be an organ designed to excite and prepare the actual photoreceptive parts of the cones and rods forming the smooth mosaic of the inner segment. *Park Lewis.*

Scheerer, Richard. **A new entoptoscope for observation of the blood current in the retina.** Klin. M. f. Augènh., 1929, v. 83, Aug.-Sept., pp. 317-318. (1 ill.)

The apparatus is described and illustrated. *C. Zimmermann.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Fazakas, Alexander. **Modern points of view in the treatment of tabetic atrophy of the optic nerve with endolumbar and suboccipital pneumocephaly.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 297-301.

Recent histological and bacteriological researches suggest that degeneration of the optic nerve is a

secondary consequence of inflammatory processes in its basal sections. The atrophy, at least in the ascertained recent cases, must be conceived as an active progressive syphilitic disease, that is an intracranial neuritis. Hence active therapy with various preparations of mercury and arsenic is indicated. Early diagnosis is of paramount importance for prevention of the atrophy. Disturbances of adaptation are important and early symptoms which point to the correct diagnosis at a time when ophthalmoscopic and visual field examinations are still negative.

The next requirement is that the substances injected into the blood shall actually reach the desired places. The hemato-encephalic barrier of the meninges is impermeable to certain drugs. It has been clinically and experimentally proven that the permeability of the meninges increases in inflammation, so that antiluetics penetrate the nervous parenchyma more readily. The author, therefore, recommended at first the combination of intravenous neosalvarsan injections with endolumbar injections of air, which produce a meningeal irritation and hyperemia, proven by the hyperemia of the ocular fundus. Recently he has supplanted the lumbar by the suboccipital route administering air before each third endocysternal injection of salvarsan. The latter is given in increasing doses from 0.5 to 3 mg.

The clinical histories of nine cases are reported. More than fifty per cent showed a measurable and permanent improvement of most retinal functions. Six other cases gave similar results.

C. Zimmermann.

Handmann. **Hereditary, probably congenital, central glious degeneration of the optic nerve with especial participation of the central vessels.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 145-152. (2 col. pl., 6 ill.)

In examining amblyopic eyes of children with strabismus, Handmann ascertained in six an apparently rare but identical affection of the optic nerve. It consisted of pallor or greenish-gray discoloration of the sharply defined disc, without excavation, involution, or entire absence of the vascular funnel. In lieu of the branching of the central vessels, the peripheral vessels arose near the border of the disc. The disc was of normal size and surrounded by an atrophic ring and pigmentation. Some abnormally developed vessels, and in one case intense proliferation of the glia between disc and macula, indicated a participation of choroid and retina. The changes, however, did not extend to the periphery of the fundus. Usually the macular reflex was lacking, suggesting a certain hypoplasia of the retina. In one case there was a direct hereditary transmission from father to son, and the author is inclined to consider the affection as congenital, and due to a disturbance of development at the time of the formation of the vascular funnel, this being replaced by mesodermal tissue damaging the nerve fibers. Vision fluctuated from 1/18 to total blindness with corresponding preserved or lost pupillary reaction.

C. Zimmermann.

Satanowsky and Adrogue. **Tumors of the optic nerve sheath.** Arch. de Oft. de Buenos Aires, 1929, v. 4, March, p. 142.

This article gives a résumé of the historical development of our knowledge of endocranial tumors, beginning with Cruveilhier in 1835. Tumors arising from the leptomeninges by proliferation of its specialized endothelial cells, are designated as meningoblastomas.

In making such a diagnosis it is necessary that the specimen be examined with particular care, especially its external surface where it approximates the dura. Its appearance may simulate either a glioma or a myxoma, the peripheral portions only showing the characteristic structure.

These tumors arise usually in the young, a slowly progressing exophthalmia being the principal sign, with deterioration of visual acuity. The exophthalmia is at first axial and irreducible, with later deviations outside

the axial line. If motility is preserved for some time it demonstrates that a free space remains between the tumor and globe. Pain is usually lacking, and the globe is well preserved.

Pupillary reactions vary in accordance with the condition of the optic nerve. The fundus can be normal, although vision may be nil, typical atrophy becoming evident later. If the mass constricts the venous outflow, there will be congestion of the disc that can develop to typical papilledema.

Extirpation of the tumor mass either with or without the globe is always indicated, and the later application of x-rays may be beneficial. Six cases are described in detail, from both the clinical and pathological standpoints.

A. G. Wilde.

Scheerer, Richard. **On the causes of retrobulbar neuritis.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 164-169.

Scheerer saw at the eye clinic in the University of Tübingen, from 1921 to 1928, 203 cases out of about 64,200 examined (0.3 per cent) of acute and chronic retrobulbar neuritis. Sixteen per cent of these showed various causes, including six per cent due to tobacco-alcohol intoxication. The majority of 171 cases (84 per cent) presented certain or probable multiple sclerosis; affections of the accessory nasal sinuses were present in three cases, or 1.5 per cent, and no known cause could be assigned in twenty-three cases (11 per cent). This shows the unimportant part played by affections of the nasal sinuses. Frequently the neuritis occurred as an early symptom of the general condition, in some it came after from one to sixteen years, so that some of the doubtful cases may develop the general symptoms of sclerosis later. With general therapy, 0.15 neosalvarsan once a week was given, often with considerable improvement of vision. Monolateral and bilateral cases were equal in number. In the less acute cases the local prognosis was good. One hundred cases presented normal ophthalmoscopic findings in spite of visual disturbances in twenty. Relapses occurred eleven times. Temporal atrophy was seen in 34 per cent, total atrophy in 14 per cent, indistinct disc in 6 per cent, central scotoma in 34 per cent. bilateral in 32 per cent, paracentral in 6 per cent, peripheral contractions and defects in 8 per cent, normal visual field in 20 per cent in spite of atrophy.

C. Zimmermann.

12. VISUAL TRACTS AND CENTERS

Biringer, Stefan. **Changes in the visual field and fundus in tumors of the hypophysis.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 153-164. (10 fields.)

The literature of the last ten years shows a great variability in the changes of the fundus and visual field associated with tumors of the hypophysis. At the clinic of Professor Elschnig at Prague ninety-six hypophysis cases were observed, but only fifty-two cases are here considered in which an affection of the hypophysis was proved with absolute certainty either by operation or by roentgenograms. The material is divided into: acromegaly, fourteen; dystrophy seven, and tumors of the hypophysis thirty-one, with clinical histories and charts of the visual fields. Bitemporal hemianopsia, considered typical for tumors of the hypophysis, occurred in twelve cases, with amaurosis of the second eye in fourteen, altogether in twenty-six out of the fifty-two cases. Frequently the nasal disturbance commences in one eye, apparently more frequently in the right, generally as relative scotoma in the temporal field and usually in connection with the blind spot. The scotoma may spread and become absolute or the color perception gradually disappears in the whole temporal half with preservation of the visual field for white. In the second eye the processes may be similar, but not always identical. Great fluctuations of the color perception and vision in the temporal half of the visual field are characteristic, as shown by the extent and quality of the scotomas. Involvement of the nasal field seems to be late,

and central vision remains longest. Atypical visual fields, encroaching of the defect on the nasal half, especially of one eye, seem to indicate spreading of the tumor to the optic nerve, particularly to one optic tract if the descending or constructive affection of the optic nerve is not evidenced by choked disc or optic neuritis.

C. Zimmermann.

Ehlers, Holger. **The cause of ophthalmic hemiplegia.** Rev. Oto-Neuro. Oft., 1929, v. 4, June, p. 255.

Attacks of megrim are occasionally associated with paresis of the third nerve, which may be either transient or persist for some time. Women develop megrim about twice as frequently as men, and seeing the frequency with which the attacks are accompanied by visible vasomotor changes of the face, it is believed they are dependent upon similar cerebral disturbances.

A cause must be found sufficient to produce changes in the cerebral cortex, and the homolateral nerve trunk of the oculomotorius, simultaneously. This possibility is found upon the inferior surface of the pons, where the third nerve is adjacent to the posterior cerebral artery.

The third nerve lies within the ramification where the basilar artery forms the posterior cerebral and superior cerebellar. The former then goes upward and backward to reach the calcarine fissure, where it divides into the calcarine and parieto-occipital arteries. The posterior cerebral thus supplies the posterior pole of the occiput, the calcarine cortex, the cuneus, the lingual gyrus, and upper posterior portions of the temporal lobe. Thus the entire visual area is dependent upon this artery, and visual changes that are vasomotor in origin must arise within this vessel. Owing to its proximity, changes within its walls or great alterations in its pressure may also affect the trunk of the third nerve.

It is noticed when the scintillating scotoma disappears, the oculomotor paresis also improves. When persisting beyond the megrim, it shows the mechanism of their production to be different, and agrees with the theory that the paresis arises from pressure exerted by the arterial wall upon the third nerve trunk.

A. G. Wilde.

Favaloro, Giuseppe. **(1) A research on the clinical morphology in the region of the optic pathway and the hypophysis in the fetus and in the adult. (2) On the pathogenetic conditions affecting the optic pathway with especial consideration of affections causing compression.** Ann. di Ottal., 1929, v. 57, April-May, p. 354.

The author's studies include: (1) the third ventricle, the optic pathway and the hypophysis, (2) the optic tract and the body of the sphenoid, (3) the chiasm and the peduncle of the hypophysis, (4) the optic tract in relation to the polygon of Willis, (5) its relation to the meninges, (6) the pituitary and the sphenoidal sinuses. The pathological conditions considered are those affecting compression, the syndromes which cause it and those which do not. In the first group are the affections which are phlogistic, edematous or atrophic, dependent on general or on local causes, and which in origin are toxic, microbial, dyscrasic, cephalo-rachidian, secondary to morbid meningeal, cerebral, or spinal processes, etc.

The second group affecting the optic pathway includes those syndromes caused by compression and causing atrophy. These include atheroma of the Willis polygon, syphilitic involvements, hydropsies of the third ventricle, tumors of the hypophysis and like causes.

Park Lewis.

Hamann, J. **Diagnosis and therapy of hypophyseal tumors.** Zeit. f. Augenh., 1929, v. 68, Aug., p. 317.

Ten cases of hypophyseal tumor were seen in the eye clinic of the University of Hamburg. The author is hopeful that in many cases the patient can be definitely helped by roentgen therapy. Those cases in which there is no evidence of destruction of the sella turcica are most favorable. Surgery is indi-

cated when there is extensive bone destruction or perforation of the sphenoid. Early diagnosis increases the chances of success tremendously.

F. H. Haessler.

Plaza and Luque. **Peripheral and central hemianopsia.** Arch. de Oft. de Buenos Aires. 1929, v. 4, March, p. 179.

When taking visual fields we must distinguish between peripheral retinal fibers, and those from the macular region that are projected in a zone from six to ten degrees around the point of fixation. While the first undergo partial decussation, those from the maculæ pass entirely to the opposite side within the central portion of the chiasm. Each retina becomes localized in the external geniculate body of each side.

Degenerations in the superior or inferior portions of the retinæ, produce corresponding lesions within the geniculate bodies, and do not extend into the thalamus. While the thalamus is not therefore directly in the visual tract, it may function in stereoscopic vision or estimation of distance.

The superior lip of the calcarine fissure repeats the superior homonymous quadrant of both retinæ; the lower lip, the opposite side. Thus a lesion limited to the superior calcarine lip, produces an homonymous hemianopsia in the inferior quadrant of the visual field.

When testing the Wernicke reaction, the light beam should be as small as possible, and directed very obliquely but avoiding the sclera so as to prevent diffusion of rays to the supposed normal side. In patients with red hair, or those having a scarcity of natural pigment, this diffusion cannot be avoided. Hence hemiakinesia will be negative even when dealing with a definite lesion of the peripheral neuron.

In exploring the macular region in detail, the Haitz charts are especially useful. Even with these central fixation must be carefully watched, and the test object brought preferably from the periphery towards the center. Otherwise the eye will instinctively follow it, and the field be given a false enlargement on that side.

Seven cases are given in detail: (1) right homonymous hemianopsia due to compression of the optic tract by tuberculoma of the thalamus, and tubercular meningitis; (2) left homonymous hemianopsia with paralysis of the third nerve of the right side in hereditary lues; (3) left homonymous hemianopsia with monocular hysterical amblyopia, disorientation and tabes; (4) right homonymous hemianopsia with word blindness, alexia, visual agnosia and cortical amblyopia; (5) right homonymous hemianopsia, followed by double and later superior hemianopsia; (6) left homonymous hemianopsia of traumatic origin; (6) left homonymous hemianopsia due to diffuse meningovasculitis.

A. G. Wilde.

13. EYEBALL AND ORBIT

Birch-Hirschfeld, A. **A spoon for introducing the fat ball into Tenon's capsule after enucleation of the eyeball.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 314-317. (3 ill.)

Birch-Hirschfeld constructed a spoon for introducing the fat ball into Tenon's capsule without pressure or tearing, which gives it a better chance to heal.

C. Zimmermann.

Dandy, Walter E. **An operative treatment for certain cases of meningocele (or encephalocele) into the orbit.** Arch. of Ophth., 1929, v. 2, Aug., pp. 123-132.

Pulsating exophthalmos may result from three conditions: 1, arteriovenous aneurism of the brain, orbit, or cavernous sinus; 2, arterial or arteriovenous aneurism of the orbit; 3, defective orbital roof. There was a congenital orbital meningocele in the case presented in this paper, due to a defect in the orbital roof. The region was approached by "a small anteriorly placed bone flap, extending from the orbital ridge to the anterior hair line or slightly beyond". The bone transplant was secured from the outer table of the skull along the posterior line of incision back of the hair line. The entire thickness was removed and then split. This

transplant was placed immediately in apposition with the remaining external and internal portions of the roof of the orbit, external to the dura, which latter, therefore, remained between the transplant and the brain. A considerable amount of fluid was allowed to escape, leaving ample space for the manipulation. The clinical diagnosis was confirmed by x-ray pictures which showed the defect in the roof of the orbit.

M. H. Post.

MacCallan, A. F. **Diagnosis and treatment of inflammatory affections of the orbit.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, p. 1.

A comprehensive survey of the etiology of inflammatory infection of the orbit, with case reports and treatment, is given by the author. The differential diagnosis between cavernous sinus thrombosis and orbital cellulitis is discussed. The former is usually bilateral, the inflammatory signs much more prominent, there is edema in the mastoid region, and fundus changes, including optic neuritis, papilledema, and venous engorgement of the retina, are present. Absence of fundus changes does not necessarily rule out sinus thrombosis.

Infection of the face may be responsible, and may consist of simple hordeolum or erysipelas. The infections of teeth and sinuses are responsible, according to the author, for about 83 per cent of the cases, and he considers no case of orbital cellulitis completely examined without x-rays of teeth and sinuses as well as a detailed clinical examination.

The first signs of a tuberculus meningitis may be orbital inflammation with tenonitis, fever, edema of the lids, and proptosis and immobility of the eye. Rupture of an acute dacryocystitis into the orbit is not infrequent, with resulting infection of the orbit. Syphilis and tuberculosis may manifest themselves in the form of gummata and tubercles which later break down and become secondarily infected.

This paper opened a formal discussion of the subject. *M. E. Marcove.*

14. EYELIDS AND LACRIMAL APPARATUS

Candian, F. L. **On Recklinghausen's disease and its various aspects. A case of neurinoma and of neuroma racemosum of the upper eyelid.** Ann. di Ottal., 1929, v. 57, April-May, p. 363.

The view has been generally accepted that Recklinghausen's disease while manifesting itself by fibrous nodes in the skin is essentially a congenital malady of the nervous system. The case reported, which was the basis of the author's observations, was that of a boy of seventeen. An elephantiasis of the left upper lid had been present since his early infancy. There was diffuse enlargement accentuated on left side until it formed a sort of sac extending over the temple; complete ptosis, the fullness of the growth giving the feeling of a mass of angleworms. Vision not affected. The growth in removal was found to be of a grayish-red color. A variety of stains were employed disclosing numerous inspissated and tortuous nerve fibers in a mass of connective tissue exeeedingly rich in nuclei.

Park Lewis.

Dean, F. W. **Stenosis of the lacrimal ducts.** Arch. of Ophth., 1929, v. 2, Aug., pp. 164-168.

An unusual method for opening the stenotic lacrimal duct is reported. An incision seven millimeters long is made into the lacrimal sac, starting just below the internal canthal ligament. The sac is washed out and is swabbed with two per cent silver nitrate. It is then packed with a wick wet with ten per cent cocaine and epinephrin. Probes from 2.5 to 4 millimeters are then passed through the duct into the nose. Afterward a 2.5 millimeter drainage tube is inserted and is allowed to remain in the duct. The duct is reopened every two to three days. Probes are passed and the tube reinserted. After about four to six visits cure has been affected and the wound is allowed to close. One hundred per cent of cures are reported.

M. H. Post.

James, R. R. **Note on concretions in the lacrimal canaliculi.** Brit. Jour. Ophth., 1929, v. 13, Sept., p. 499.

This is the case report of a young man with a concretion lodged in the upper canaliculus, the lower being perfectly free. The fact that the conjunctiva and lower duct had received treatment without result indicates the need of careful attention to the upper canaliculus. *D. F. Harbridge.*

Kreiker, A. **Operation on blepharochalasis with sutures devised by Blaskovics for formation of palpebral folds.** Klin. M. f. Augenh., 1929, v. 83, Aug.-Sept., pp. 302-305. (3 ill.)

A man aged thirty-two years was affected with blepharochalasis after relapsing edematous swellings of the lids. In conversation he was compelled to raise the eyebrows and the head as in ptosis. The following operation was performed: after a horizontal incision four or five millimeters below the eyebrow the whole skin of the lid was dissected to the lid border with knife and scissors, and the mushy tissue between skin and anterior surface of tarsus and fascia removed. Three loop sutures were inserted into the exposed levator, two or three millimeters above the convex border of the tarsus, without piercing the posterior conjunctival side. The skin was reflected and stitched and all threads carried through a little lower, from one to two millimeters above the convex border of the tarsus, pulled taut and tied, and the wound closed. Thus the connecting apparatus between levator and skin had been reestablished. The result, as a photograph after five months shows, was very good.

C. Zimmermann.

Margotta, Giuseppe. **Primary melanosarcoma of the lacrimal sac.** Ann. di Ottal, 1929, v. 57, April-May, p. 387.

This exceedingly rare disease was found in a woman of 47. In the region of the left lacrimal sac was noted a tumefaction of the size of a hazelnut. It extended downward below the orbital border and over the nasal bone with which it appeared to be in contact. The skin covering the growth seemed normal and showed no evidence of inflammation. On palpation the tumor was elastic with an irregular bilobate surface, divided by a sagittal sulcus. The probe could not pass the lacrimal canal. On the bulbar conjunctiva at the semilunar fold was an elevation of the size of a pea, and dark in color. Under local anesthesia the growth was removed and the preoperative diagnosis of malignancy confirmed. A year later the left nasal fossa was occluded by a second growth which was also removed. The patient died a year later from a metastatic tumor elsewhere.

The author takes occasion to discuss the various questions as to the order of development, histopathological and clinical, the origin and the nature of the pigment in melanosarcoma. The misleading character of the symptoms emphasizes the necessity of an early and correct diagnosis, as radical removal may prolong the life of the sufferer for many years.

Park Lewis.

Zentmayer, William. **Mixed tumor of the lacrimal gland.** Trans. Amer. Ophth. Soc., 1928, v. 26, p. 82.

The left upper lid had shown a swelling, and for the past few months an increased proptosis, diplopia on looking up and gradual loss of vision, with attacks of complete blindness lasting a few seconds. This case had been treated with x-rays for eleven months without any appreciable change in the symptoms, after which an operation was performed and an encapsulated growth removed.

The pathologic examination showed that it was a mixed tumor similar in type to those found in the parotid and submaxillary glands, palate, neck, and elsewhere. This opinion was further supported by its exact resemblance to these tumors. The growth was relatively benign. It had the same tendency to recur that parotid tumors have —twenty-five to thirty per cent—but metastasis was not to be expected.

E. G. Lear.

NEWS ITEMS

News items in this issue were received from Drs. W. Holbrook Lowell, Boston; Robert J. Masters, Indianapolis; James M. Patton, Omaha; G. Oram Ring, Philadelphia; Edward R. Ryan, Milwaukee; and Charles P. Small, Chicago. News items should reach **Dr. Melville Black**, Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. John Jay Gardner, Montreal, aged seventy-two years, died August thirty-first.

Dr. Dean Foster, Stamford, Connecticut, aged fifty-nine years, died September sixteenth, of heart disease.

Dr. P. Somers Smyth, Boston, aged fifty-three years, died October twenty-eighth. Dr. Smyth was a former house officer at the Massachusetts Eye and Ear infirmary and later served for some time on the staff of that institution, until his health compelled him to resign. During the World War he went on duty again at the hospital, taking the place of men who had gone into the army.

Dr. Harold Gifford of Omaha died suddenly at his home early in the morning of Thanksgiving, aged seventy-one years.

Miscellaneous

In the news items of our October issue, Lewis H. Carris, managing director of the National Society for the Prevention of Blindness, was quoted as saying in an address that nearly all blindness was "easily" preventable. Mr. Carris writes to say that the press release from which the item was taken was incorrect in representing him as using the word "easily"; and in the interest of accuracy he asks that this correction be noted.

The German "Archiv für Augenheilkunde," founded by Herman Knapp during his Heidelberg period, recently published its one-hundredth volume.

Conferences were held throughout the counties of Maryland last summer for the examination of children to be admitted to school for the first time this fall. The conferences were sponsored by the state department of education, the parent-teacher associations, and the state department of health. The examining physicians noted the condition of the heart, lungs, eyes, nose, throat, and teeth, and the weight and posture of the children. Of the 3,755 children examined, one-fourth were underweight. Bone changes were observed in 110; faulty posture in 252; unfavorable conditions of the lungs in 97; of the heart, 99; of eyes and ears, 56; and mental retardation in 17. Only half of them had been vaccinated.

At the International Congress of Ophthalmology, an International League Against Trachoma was formed. The representatives from the United States at this conference were Drs. F. Park Lewis, Buffalo; Walter R. Parker, Detroit; Charles Weiss, New York; and William H. Wilder, Chicago. An exhaustive report on the subject was made by Dr. Lutrario of Rome and Dr. Jitta of Amsterdam. An international league against trachoma was formed and Professor de Grosz of Budapest was appointed president and Dr. Wibaut of Amsterdam secretary of this organization. It was proposed to attempt to enlist the aid of the health committee of the League of Nations and that of the Rockefeller Foundation. Various ophthalmological societies have been requested to send delegates to a conference to be held, probably in Geneva, in the spring of 1930.

The University of Barcelona, Spain, has established a two years' course in ophthalmology, beginning in September of each year, with a maximum of ten students in each course. The stated subjects of the course include: anatomy on the cadaver, physiologic and pathologic optics, details of dispensary technique, elements of special bacteriology, operations on the cadaver, technique of the examination of refraction, special histopathology and biomicroscopy, clinic on external affections and ophthalmoscopy, operative sessions with commentary. At the end of the two years' course each student will be required to present a special thesis; and diplomas will be issued (doctorate in ophthalmology) showing the educational attainments of each student.

The certificate of the American Board for Ophthalmic Examinations has now become a requirement for promotion at the Brooklyn Eye and Ear hospital. The following members of the hospital staff applied for certificates of the Board on October 19, 1929: Drs. W. B. Agan, M. Buonaguro, R. Cutino, W. B. Ebeling, E. K. Hallock, W. Moehle, W. Moore, and J. Walther. These men belong to a group who conducted a systematic two years' course of study in the microscopic pathology of the eye, given at the Long Island college of medicine under the leadership of Dr. John N. Evans. In this group are also to be found the members of the Cilio-Retinal Club, who have met regularly once a week for almost five years.

If your patients insist on telling you of people who have been completely cured by eye exercises, take comfort in the following (copied from the British Journal of Ophthalmology): In the diary of Abraham de la Pryme, the Yorkshire antiquary, in the year 1695, occurs the following note, "There was at Bramwith near Hatfield an old clerk that could scarce ever get a pair of spectacles that he could see with, his sight was either so vitiated or destroyed. At last an old wife tells him a way how he might see without spectacles—to get a prayer book printed upon yellow paper. At last he got such a one, and though it was but a small

print, yet I observed that (he) saw and read with as much ease as if it had been ever so bigg."

American Academy of Ophthalmology and Otolarynogology: The officers of the Academy for the coming year are: president, Dr. W. H. Wilder, Chicago; president-elect, Dr. John F. Barnhill, Miami Beach, Florida; first vice-president, Dr. F. R. Spencer, Boulder, Colorado; second vice-president, Dr. Fred A. Kiehle, Portland, Oregon; third vice-president, Dr. Robert Sonnenschein, Chicago; executive secretary, Dr. W. P. Wherry, Omaha; secretary for ophthalmology, Dr. William L. Benedict, Rochester, Minnesota; secretary for otolaryngology, Dr. John Myers, Kansas City, Missouri; secretary for instruction, Dr. Harry S. Gradle, Chicago; treasurer, Dr. S. H. Large, Cleveland; members of council, Drs. John J. Shea (Memphis), Fred Stauffer (Salt Lake), J. L. McCool (San Francisco), and John M. Wheeler (New York); member of American Board for Ophthalmic Examinations, Dr. Sylvester J. Beach, Portland, Maine. With regard to the editing of the Transactions, a temporary arrangement will be made pending the selection of a successor to Dr. Clarence Loeb, resigned. Fuller report of the proceedings of the Academy at its annual meeting is unavoidably postponed until our January issue, on account of the absence of Dr. Wherry at the time of making up the present issue.

Societies

The Central Wisconsin Eye, Ear, Nose, and Throat Society held its meeting at the Mayo Clinic, on September twenty-seventh.

The Chicago Ophthalmological Society and the Chicago Laryngological and Otological Society gave a dinner to the visiting members of the American College of Surgeons, October sixteenth, at the Stevens Hotel.

The Medical Club of Philadelphia at its October meeting gave a dinner and reception in honor of Professor Ernst Fuchs of Vienna. The Chicago Ophthalmological Society gave a luncheon in honor of Professor Fuchs, at the University Club, on October twenty-ninth.

The annual meeting of the Academy of Ophthalmology of Indiana will take place at the French Lick Springs Hotel, December 12 and 13, Dr. A. E. Bulson presiding. The guest of honor will be Dr. E. C. Ellett of Memphis.

At the October meeting of the section on ophthalmology of the College of Physicians of Philadelphia, Dr. Arthur Bedell of Albany, New York, exhibited a series of beautiful fundus photographs taken by the method of Professor Nordensen. Dr. Joseph V. Klauder of the graduate school of the University of Pennsylvania read an interesting communication upon "The clinic for the treatment of ocular syphilis at Wills hospital."

The Oxford Ophthalmological Congress will be held in 1930 on July tenth, eleventh, and twelfth.

On November 11 and 13, at the Hotel Chase, Saint Louis, the National Society for the Prevention of Blindness held an Annual Conference in cooperation with the Missouri State Board of Health, the State Bureaus of Mines, of Labor, and of Industrial Inspection, the Missouri Commission and Association for the Blind, the Saint Louis public schools, the American Legion, the Ophthalmic Section of the Saint Louis Medical Society, the Missouri Social Hygienic Association, and sight-saving class supervisors and teachers. The following ophthalmologists participated in the discussion: Professor Ernst Fuchs, Vienna; Drs. Daniel M. Velez, of Mexico City; Edward H. Cary of Dallas, C. S. O'Brien of Iowa City, and Drs. John Green, William Luedde, Charles Weiss, and Meyer Wiener of Saint Louis.

The International Association for the Prevention of Blindness was formed at the Hague on September fourteenth, the day following the International Congress. Representatives from twenty-five countries were in attendance. Professor Felix de Lapersonne was chairman of the conference and was elected president; Dr. F. Park Lewis, Buffalo, was elected vice-president; Dr. F. Humbert, chief of the health section of the League of Red Cross Societies, was elected secretary-general; and Dr. M. R. Demachy was elected treasurer. The executive committee was to be composed of Professors J. Van der Hoeve, Holland; Axenfeld, Germany; E. von Grosz, Hungary; J. Szymanski, Poland; A. Trantas, Greece; Maggiore, Italy; Drs. B. Cridland of Great Britain, and Shinobu Ishiwara of Japan; and one representative of South America, and one of Mexico or Central America. Also present at the meeting were: Drs. Conrad Berens and Olga Sitchevska, New York; William H. Wilder and George F. Suker, Chicago; and Charles Weiss, Saint Louis.

Personals

Dr. Hallard Beard of Chicago was married on October nineteenth to Miss Irene Turner.

Dr. Casey Wood has just published his translation of "De Oculis" by Benevenutus Grassus of Jerusalem, published in 1474.

Dr. C. S. O'Brien, department of ophthalmology, University of Iowa, has recently returned from an extended visit to the European medical centers.

Dr. Lucien H. Lanier, Texarkana, will address the Bowie and Miller county medical societies of Texas, December twentieth, on "Prevention of defective vision."

Dr. Cyril F. Lauer, Pittsburgh, addressed the Allegheny County Medical Society, October fifteenth, on "Educational, economic, and social aspects of eye muscle defects."

Dr. Harry Friedenwald has been appointed emeritus professor of ophthalmology and Dr. Harvey K. Fleck associate professor of

ophthalmology in the University of Maryland school of medicine, Baltimore.

Dr. Meyer Wiener, Saint Louis, Missouri, addressed the Milwaukee Oto-Ophthalmic Society at its regular meeting on October twenty-sixth, on "Some points in the technique of ophthalmic surgery," with lantern slide demonstration.

Dr. Charles P. Small, of Chicago, was the guest of the Pennsylvania state medical society at its annual meeting in Erie, in October. He read a paper on "The routine examination of the eye in its bearing on present-day motor traffic."

At the annual meeting of the Wills Hospital Society, at the Bellevue-Stratford Hotel, Philadelphia, on October twenty-fifth, Dr. Edward Jackson was elected president, Dr. Emory Hill, vice-president, and Dr. Warren Reese, secretary. Mr. Wierzbicki, superintendent of the hospital, was elected an honorary member. He spoke with regard to plans for a new hospital building. The subject of celebrating the centennial of the building of the hospital, two or three years from now, was discussed, and both matters were referred to a committee. The Wills Hospital Society is composed of past and present hospital surgeons and residents.

The second annual series of medical lectures under the Colver lectureship, College of Medical Evangelists, Los Angeles, was given November 5 to 7 by Dr. Joseph A. Stucky of Lexington, Kentucky, on (1) "Our contemporary ancestors", (2) "The salvaging of these 100 per cent Americans", and (3) "Present conditions and the future outlook".

The president-elect of the British Medical Association this year is Dr. William Harvey Smith, professor of ophthalmology at the University of Manitoba. The British Medical Association will hold its annual meeting next year in Winnipeg.

Dr. John O. McReynolds was a delegate to the Amsterdam congress from the ophthalmological association of Mexico and from the Texas Eye, Ear, Nose, and Throat Society.

American Board for Ophthalmic Examinations

July Meeting: The American Board for Ophthalmic Examinations held its twenty-ninth examination at the Doernbecher Memorial hospital, Portland, Oregon, Monday, July 8, 1929. Excellent facilities and ample material for conducting the examination were provided, arrangements having been made by Dr. Joseph L. McCool, with the cooperation of Miss Grace Phelps, superintendent of the Doernbecher hospital.

Drs. Patton and Crisp, members of the Board, were present and conducted the examination. They were assisted by: Clinton T. Cook, W. C. Finnoff, E. L. Goar, Edward Jackson, W. Johnston, Walter Lancaster, W. I. Lillie, Joseph McCool, D. D. McHenry, D. H. O'Rourke, C. W. Rutherford, Carroll Smith, C. M. Swab, G. W. Swift, C. A. Veasey, C. B. Walker, and John E. Weeks.

The practical examination was held in the morning and the written in the afternoon. Eighteen candidates presented themselves for this examination.

October Meeting: On account of the large number of candidates applying, the Board was obliged to hold two examinations at the time of the meeting of the American Academy of Ophthalmology and Otolaryngology.

The first of these, the Board's thirtieth examination, was held at the Vanderbilt clinic, New York City, Saturday, October 19, 1929. The following members of the Board were present and conducted the examination of thirty-four candidates: Dr. E. C. Ellett, president; Dr. William H. Wilder, secretary-treasurer; and Drs. F. P. Calhoun, Allen Greenwood, and John M. Wheeler.

The examination was in charge of Dr. Allen Greenwood, chairman of the committee on examinations. Arrangements had been made by Dr. John M. Wheeler, and through the kind cooperation of Mr. Duff Maynard, superintendent of the Vanderbilt clinic, in providing convenient equipment and ample clinical material, the examination was conducted expeditiously. The examiners in the various subjects were as follows: External diseases: Drs. J. H. Dunnington and E. C. Ellett; Ophthalmoscopy: Drs. F. P. Calhoun and A. B. Reese; Anatomy and pathology: Drs. D. B. Kirby and Bernard Samuels; Refraction: Drs. S. J. Beach and J. M. Wheeler; Muscles: Drs. Conrad Berens and W. L. Hughes; Perimetry: Dr. John N. Evans; General diseases and therapeutics: Drs. T. H. Johnson and W. H. Wilder.

The written examination was held in the afternoon, when the following questions were presented:

1. a. Give anatomy and embryology of the iris.
   b. Trace the nerve fibers from the upper half of the retina to their termination in the brain.
2. a. How treat a patient with four diopters of hypermetropia, five degrees of esophoria and three degrees of right hyperphoria.
   b. Transpose the following:
   -1.00 sph. $+3.00$ cyl. ax. 112°.
   $+2.00$ sph. -2.50 cyl. ax. 10°.
3. Describe the fundus picture of thrombosis of the central vein. Give treatment. What complication may follow and how treated?
4. Give picture of acute primary glaucoma and your treatment for the same.
5. Describe ocular signs which may occur in early and late acquired lues.

The Board held its thirty-first examination at the Wills hospital, Philadelphia, Monday, October 21, 1929, when thirty candidates presented themselves.

The following members of the Board were present: Dr. E. C. Ellett, president; Dr. William H. Wilder, secretary-treasurer; and Drs. F. P. Calhoun, W. H. Crisp, Allen Greenwood, James M. Patton, and John M. Wheeler.

Arrangements for the examination had been made by Dr. Alfred Cowan, and Mr. Stephen Wierzbicki, superintendent of the Wills hospital, gave valuable assistance in providing good facilities and ample material.

The following assisted the members of the Board in examining the candidates: L. F. Appleman, S. J. Beach, W. L. Benedict, Conrad Berens, Frank T. Burch, Alfred Cowan, W. T. Davis, J. H. Dunnington, J. M. Griscom, Harvey J. Howard, Edward Jackson, W. I. Lillie, Joseph L. McCool, W. S. Reese, C. W. Rutherford, Hunter W. Scarlett, James M. Shields, Frederick F. Teal, Webb W. Weeks, and William Zentmayer.

The practical examination in the usual subjects was held in the morning, and the written at the Post-Graduate hospital in the afternoon of the same day.

The Board held its usual executive session that evening at the Traymore hotel, Atlantic City, and granted its certificate to the following physicians:

Adler, Francis H., Philadelphia, Pennsylvania.
Agan, William Byron, Brooklyn.
Bane, William C., Denver.
Beil, John W., Kansas City, Missouri.
Borgeson, Egbert J., Minneapolis.
Botham, Louis, Chicago.
Boyce, William A., Los Angeles.
Bray, E. R., Saint Paul, Minnesota.
Bruce, Gordon M., New York City.
Bruère, Gustav E., Portland, Oregon.
Buonaguro, Michael J., Brooklyn.
Cady, Donald W., Pasadena, California.
Carter, L. F., Detroit.
Clay, Grady E., Atlanta, Georgia.
Cogan, Edith I., Peabody, Massachusetts.
Crawford, J. William, San Francisco.
Cunningham, H. L., Cape Girardeau, Missouri.
Cutino, Rudolph M., Brooklyn.
Dyer, Clyde P., Saint Louis.
Ebeling, William B., Brooklyn.
Feldman, Louis A., Brooklyn.
Fewell, Alexander G., Philadelphia.
Gissy, Carl J., Saint Louis.
Gough, Roy H., Fort Worth, Texas.
Gouterman, Joseph I., Philadelphia.
Hallock, Earle K., Brooklyn.
Jacobs, Max W., Saint Louis.
Keller, Joseph M., Saint Louis.
Kelly, Aquin S., New York City.
King, George, Jr., Alliance, Ohio.
Lachman, George S., San Francisco.
Lillie, W. I., Mayo Clinic, Rochester, Minnesota.
Mann, Benjamin H., Philadelphia.
McCoy, Leslie L., Seattle.
Mensher, Ira W., Brooklyn.
Minton, William H., Saint Joseph, Missouri.
Moehle, Walter, Brooklyn.
Moore, Walter V., Brooklyn.
Neulen, E. Nelson, Portland, Oregon.
Norton, Arthur H., Eugene, Oregon.
Nova, Jules M., Brooklyn.
Nugent, Oscar B., Chicago.
Olmstead, William D., Atlantic City, New Jersey.
Orcutt, Dwight C., Chicago.
Pinkerton, F. J., Honolulu.
Place, E. Clifford, Brooklyn.
Post, Winfred B., Carthage, Missouri.
Reid, Horace W., Cincinnati.
Rucker, Charles W., Minneapolis.
Ryan, Edward R., Milwaukee.
Scott, Clive D., Louisiana, Missouri.
Simpson, George V., Washington, D.C.
Starcke, Herman, Brooklyn.
Taylor, Edgar M., Portland, Oregon.
Terry, Theodore L., Boston.
Tradelius, Paul, Brooklyn.
Underwood, H. L., Portland, Oregon.
Waite, John H., Boston.
Walther, John W., Brooklyn.
Webster, Franklin R., Syracuse, New York.
Weymann, Morie F., Los Angeles.
Wiley, Jason L., Philadelphia.
Williams, Carl, Philadelphia.

Dr. Luther C. Peter has been elected representative of the American Ophthalmological Society on the Board; Dr. John Green has been elected representative of the section on ophthalmology of the American Medical Association; and Dr. Sylvester Judd Beach has been elected representative of the American Academy of Ophthalmology and Otolaryngology; the term of each of these new members beginning January 1, 1930.

The Board will hold an examination in Detroit at the time of the meeting of the American Medical Association, June, 1930, and another in Chicago in October, 1930, at the time of the meeting of the American Academy of Ophthalmology and Otolaryngology.

WILLIAM H. WILDER, *Secretary*
122 South Michigan boulevard, Chicago

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NOTICE

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